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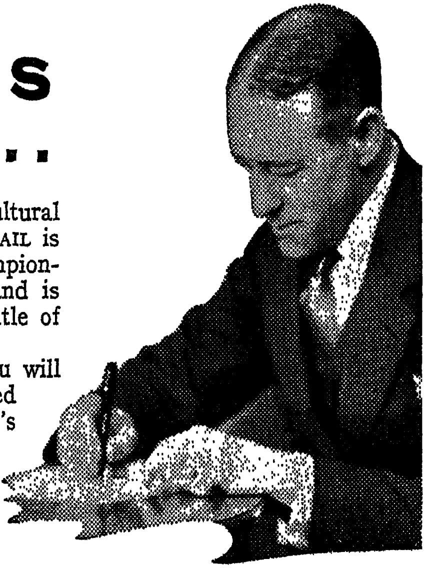

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TRANSACTIONS

OF

THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND

◆

THE IMPORTANCE OF HOME-PRODUCED FEEDING-STUFFS.

WITH SPECIAL REFERENCE TO THE CONSERVATION OF GRASS.

By NORMAN C. WRIGHT, M.A., D.Sc., Ph.D.,
The Hannah Dairy Research Institute.

THE predominant occupation of British agriculture is the production of live stock. According to recent statistics, live stock and live stock products account for roughly two-thirds of the total estimated value of the agricultural output of England and Wales. The figures for Scotland are even higher, such products constituting over four-fifths of the country's agricultural output. Again, it has been estimated that more than 85 per cent of the total agricultural area of Great Britain is used for grazing or for the production of crops which are utilised for stock feeding. It is therefore surprising to find that few serious attempts have been made to assess the total quantities of feeding-stuffs available for the nutrition of the live stock population, or to determine the proportions in which the various classes of feeding-stuffs contribute towards this total. Much discussion has, it is true, been devoted to the general problem of the country's food supplies, but this has been chiefly concerned with the quantity of food directly available for human consumption, rather than with the amount of feeding-stuffs available for conversion into live stock products.

This neglect is, perhaps, the more remarkable in view of the conclusive evidence which is now available that the primary nutritional requirement of our population is for an increased consumption of so-called 'protective' foods and of foods rich in 'first-class' protein, among which the most important are milk, eggs, and meat. With the gradual rise in the standard of living during the past fifty years the *per capita* consumption of these products has, in fact, already shown a remarkable increase. Since 1881 the consumption of meat per head has increased by 45 per cent, while butter consumption has been doubled.[1] Again, a comparison of the *per capita* consumption of eggs in 1909-13 with that in 1934 shows a 50 per cent increase, while the consumption of cheese has increased by 36 per cent.[2] As regards eggs, the increase in the *per capita* consumption has been largely met by an expansion in home production, and home-produced eggs now constitute nearly 70 per cent of the total available supplies. But the country still has to rely largely on imports for adequate supplies of meat and dairy products. Imported meat provides about 60 per cent of the available supplies, while roughly 90 per cent of butter and 70 per cent of cheese are imported from overseas. Moreover, although the whole of our present supply of liquid milk is home produced, there are already indications that excessive dependence on imported feeding-stuffs may have a serious effect in limiting milk production—a fact which is particularly unfortunate in view of the special efforts which are being made to increase the *per capita* consumption of milk.

With the adoption of a more constructive food policy it is, indeed, probable that the *per capita* consumption of all live stock products will tend to increase markedly during the next decade. It is obviously desirable, therefore, that the country should not only be in a position to provide a larger proportion of existing supplies of such products, but that any expansion in demand should, so far as possible, be met by increased home production. Both these objectives will, however, require an equivalent expansion in the supplies of feeding-stuffs. In view of this fact it appears opportune to take stock of our present resources of home-produced feeding-stuffs and to determine, if it appears necessary, how best these can be increased.

ORIGIN AND QUANTITIES OF FEEDING-STUFFS AT PRESENT AVAILABLE.

What, then, is the present position regarding the origin and quantity of feeding-stuffs available in the country? It is, of course, extremely difficult to assess the output of certain

---

[1] 'Food, Health, and Income.' Sir J. B. Orr. Published by M'Millan & Co., London (1936).

[2] 'Report of the Advisory Committee on Nutrition.' Ministry of Health. Published by H.M. Stationery Office (1937).

TABLE I. APPROXIMATE QUANTITIES OF FEEDING-STUFFS AVAILABLE IN THE UNITED KINGDOM (1935).

Origin and Class of Feeding-Stuff	Total supplies (thousands of tons).	Available nutrients (thousands of tons).		Percentage of nutrients supplied by each class of Feeding-Stuff.	
		Protein equivalent.	Starch equivalent.	Protein equivalent.	Starch equivalent
HOME PRODUCTION—					
(*a*) *From arable land*—					
(i) Cereals, including wheat offals	2,966	246	1,842	7·1	8·7
(ii) Rotation grazing, including aftermath . .	3,917*	605	2,910	17·6	13·7
(iii) Rotation hay .	2,818	197	986	5·7	4·7
(iv) Roots and green crops . .	2,140*	101	1,213	2·9	5·7
(v) Straw . .	2,730	16	522	0·5	2·5
Total . .	14,571	1,165	7,473	33·8	35·3
(*b*) *From permanent grass*—					
(i) Grazing on permanent grass, including aftermath . .	11,110*	1,111	6,666	32·1	31·5
(ii) Hay from permanent grass .	5,553	222	1,944	6·4	9·1
(iii) Rough grazings	1,500*	15	300	0·4	1·4
Total . .	18,163	1,348	8,910	38·9	42·0
(*c*) *From by-products*—					
(i) Brewers' and distillers' grains .	150	22	75	0·6	0·3
(ii) Meat meal, blood meal, &c. .	65	23	44	0·7	0·2
(iii) Fish meal .	60	32	35	0·9	0·2
Total . .	275	77	154	2·2	0·7
Total home production .	33,009	2,590	16,537	74·9	78·0
IMPORTED PRODUCTS					
(*a*) *Cereals and cereal products*—					
(i) Maize and maize products .	2,975	223	1,945	6·4	9·2
(ii) Other cereals, including wheat offals . .	3,038	303	1,727	8·8	8·2
Total . .	6,013	526	3,672	15·2	17·4
(*b*) *Oil-seed products*—					
(i) Oil-seeds . .	912	125	452	3·6	2·1
(ii) Cakes and meals	823	216	537	6·3	2·5
Total . .	1,735	341	989	9·9	4·6
Total imported products	7,748	867	4,661	25·1	22·0
Total supplies (all sources)	40,757	3,457	21,198	100·0	100·0

* As equivalent dry matter.

agricultural products, such as grass, with any close degree of accuracy. In Table I. an attempt has, however, been made to arrive at a reasonably close estimate of the total nutrients available.[1] The figures given are admittedly approximate, but they will serve to give some indication of the present position.

The available feeding-stuffs may be classed into three main groups—namely: (1) cereals and other products of arable farming, which are in general relatively rich in energy; (2) oil-seed products and certain home-produced by-products, which are rich in protein; and (3) grass and hay, which are of very variable composition. In order to bring the figures to a common basis of comparison, the quantities of protein equivalent and starch equivalent [2] (a measure of the energy content of the food) have been calculated, and percentages have been inserted to show the extent to which each class of feeding-stuff contributes to the total available supplies. It will be seen that these amount to an aggregate of approximately 40 million tons, and contain just under 3½ million tons of protein equivalent and about 21 million tons of starch equivalent.

In view of the admitted difficulties in arriving at a reasonable estimate of the nutrients available in certain classes of feeding-stuffs, and particularly in pasture, a second method of estimation has been employed in an attempt to check the accuracy of the figures given in Table I. By applying recognised feeding standards an independent calculation has been made of the estimated food requirements of the country's total live stock population.[3] The results of this calculation are given in Table II. It will be seen that, considering the approximations which are inevitable in arriving at an estimate of this nature, the agreement between the calculated food requirements and the estimated available supplies of nutrients is extraordinarily close, being within roughly 5 per cent for both protein and starch equivalents. Moreover, further examination of the figures shows that agreement is equally close when the food requirements are considered in relation to the different classes of feeding-stuffs from which they are derived. Middleton [4] has given estimates of the relative amounts of cereals and concentrates, roots and straw, and grass and hay required for meat and milk production. By applying these to the total food requirements of each class of stock (as shown in the three right-hand columns of Table II.)

---

[1] Details of the method of computing Tables I. and II. are given in a special note at the end of this paper.

[2] For an explanation of these terms the reader is referred to Bulletin No. 48 issued by the Ministry of Agriculture entitled "Rations for Live Stock."

[3] This calculation was made independently by Dr S. Morris.

[4] 'Food Production in War.' Sir T. H. Middleton. Published by Oxford University Press (1923).

TABLE II. APPROXIMATE FOOD REQUIREMENTS OF LIVE STOCK IN THE UNITED KINGDOM (1935).

Class of Live Stock.	Total Food Requirements (thousands of tons).		Quantity of nutrients * derived from		
	Protein equivalent.	Starch equivalent.	Cereals and concentrates.	Roots and straw.	Grass and hay.
Dairy cattle	930	5,580	1,060 (19%)	780 (14%)	3,740 (67%)
Beef cattle	650	4,870	1,070 (22%)	1,020 (21%)	2,780 (57%)
All cattle	1,580	10,450	2,130	1,800	6,520
Sheep	980	6,720	940 (14%)	1,610 (24%)	4,170 (62%)
Horses	330	2,280	570 (25%)	..	1,710 (75%)
Pigs	390	1,670	1,620 (97%)	..	50 (3%)
Poultry	290	1,750	1,650 (94%)	..	100 (6%)
Total requirements, all stock	3,570	22,870	6,910 (30%)	3,410 (15%)	12,550 (55%)

* The nutrients are expressed in terms of thousands of tons of starch equivalent. The percentages for dairy and beef cattle and for sheep are taken from Middleton; the percentages for horses, pigs, and poultry are the author's own estimates.

it is possible to arrive at an estimate of the quantities of each class of feeding-stuff theoretically required, and this may then be compared with the actual supplies available (Table I.). The results of such a comparison are as follows :—

	Cereals and concentrates.	Roots and straw.	Grass and hay.
	Per cent.	Per cent.	Per cent.
Requirements (from Table II.)	30	15	55
Available supplies (from Table I.)	32	8	60

It will be seen that the agreement for cereals and concentrates is very close. The supplies of roots and straw are roughly 50 per cent less than Middleton's estimate of the requirements. His figures refer, however, to pre-war conditions, and (as will be shown later) the acreage of roots has fallen since that time by almost one-half, while the supplies of straw are also smaller owing to the general decrease which has taken place in the home production of cereals. This deficiency in the supply of roots and straw is counterbalanced by a proportionate increase in the amount of grass and hay. The close agreement, therefore, not only between the total quantities of nutrients required with those available, but in the division of these nutrients among the three main classes of feeding-stuffs, indicates that the figures given in Table I. may probably be looked upon as reasonably accurate.

At first sight these figures reveal a rather unexpected fact. It is frequently assumed that this country is very largely dependent on imported feeding-stuffs for the nutrition of the live stock population. Examination of Table I. shows, however, that the proportion is smaller than is usually supposed. Imported cereals supply only 15 per cent of the total supply of protein and only 17 per cent of the supply of energy, while imported concentrates contribute less than 10 per cent of the protein and only a little over 4 per cent of the energy. Imported feeding-stuffs provide, therefore, only some 22 to 25 per cent of the total nutrients available for the feeding of stock. It may be noted that this figure is roughly confirmed if the monetary value of imported feeding-stuffs is compared with that of the total output of live stock products. The value of imported feeding-stuffs is estimated at between £30 and £40 million, while live stock products are valued at about £180 million. Imported feeding-stuffs account, therefore, for between 16 and 22 per cent of the estimated value of live stock products. This, after making an allowance for labour costs involved in the management of stock, is of the same order as the estimate of 22-25 per cent shown in Table I.

The fact that imports provide only one-fourth of the country's total requirements of feeding-stuffs is, however, largely attributable to the preponderance of grass as a source of nutrients for stock. This is, indeed, one of the outstanding features of the present position which is revealed in Table I. Although the value of grassland has always been recognised, the magnitude of its contribution to animal husbandry in Great Britain is not always realised. Table I. shows that (including rotation grass and hay) over 60 per cent of the total available nutrients are derived from this source alone.

The importance of cereals and concentrates derived from overseas appears in a very different light if grassland products are omitted from consideration. It will then be seen that home-grown cereals provide less than one-third of the total cereals available for stock feeding. The imports of maize alone are, indeed, equivalent to the whole of the home-produced cereals. The quantity of imported concentrates also very greatly exceeds the home production of protein-rich by-products. The supplies of cereals and concentrates are, moreover, of special importance in live stock economy for two reasons: first, because for the feeding of certain classes of stock (*e.g.*, pigs and poultry) practically the whole nutrients are derived from these sources; and second, because—although grassland products play such an important part in providing nutrients during the summer period—it is essential to have an adequate supply of conservable food for winter feeding. Reference will be made in later pages to the possibility of expanding the home production of grassland products and of protein-rich by-products. It will, however, be well at this point to discuss in some detail the reasons for the low level of home production of feeding cereals and of other products of arable farming which contribute to the general supply of feeding-stuffs.

The factors responsible for the general decline of arable farming in this country are well recognised. The area of land under arable cultivation in Great Britain reached its peak between 1872 and 1875. During subsequent years it declined progressively, a fact which is clearly shown in Fig. 1, where the acreages devoted to the major crops in Great Britain are plotted for successive five-year periods. This reduction in arable acreage was primarily due to the catastrophic fall in the price of wheat which followed the opening up of communications with the new Western countries. Between 1874 and 1894 the price of wheat fell by nearly 60 per cent, from 55s. to 23s. per quarter, a price at which the home-grown crop could not be produced economically. Simultaneously, farmers were faced with insistent demands for an increase in wage rates in order to enable farm labourers to improve their admittedly low standard of living. The natural sequel was the turnover of many thousands of acres of arable land to permanent grassland, that is to a type of farming which, while reducing the total output of food from the land, involved the farmer in less financial risk and reduced his dependence on hired labour. By the time that wheat prices had risen from these disastrously low levels Great Britain had become a highly industrialised nation with an export trade sufficient to enable the bulk of her cereal supplies to be purchased abroad. The turnover from arable to grassland farming consequently persisted (with the exception of the war period, when special efforts were made to increase the home production of cereals) up to the present decade.

The inevitable result of this turnover to grassland was, however, not only a progressive falling off in the acreage of wheat (and therefore in the production of wheat offals), but an increasing reliance on imported cereals and concentrates as substitutes for other products of arable farming. Thus the acreage under barley fell by about 60 per cent, while the acreage under beans and roots also showed a more or less consistent reduction throughout the whole period, the acreage of beans reaching, by 1934, a figure equivalent to only 25 per cent of that of 1877 (Fig. 1). In Scotland the fall in the bean acreage was even more spectacular, the 1934 figure being only one-tenth of that of 1877. The oat crop, which held its own until the post-war period, has since shown a sharp decline in both England and Scotland. It is, of course, true that improvements in plant breeding and in methods of cultivation have resulted in increased yields per acre of certain crops. But with most crops any such improvements in yield have been quite insufficient to offset the effect of the very large reductions in acreage.

The fall in the home production of feeding stuffs has been paralleled by a marked increase in the volume of imported cereals and concentrates, as shown in Fig 2. This increase was consistent throughout the fifty years between 1861 and 1911. Although the war period gave a set-back to the importation of feeding-stuffs, the subsequent recovery has been rapid, especially in the imports of maize. Only oats and beans have shown a decline, for reasons which will be discussed later.

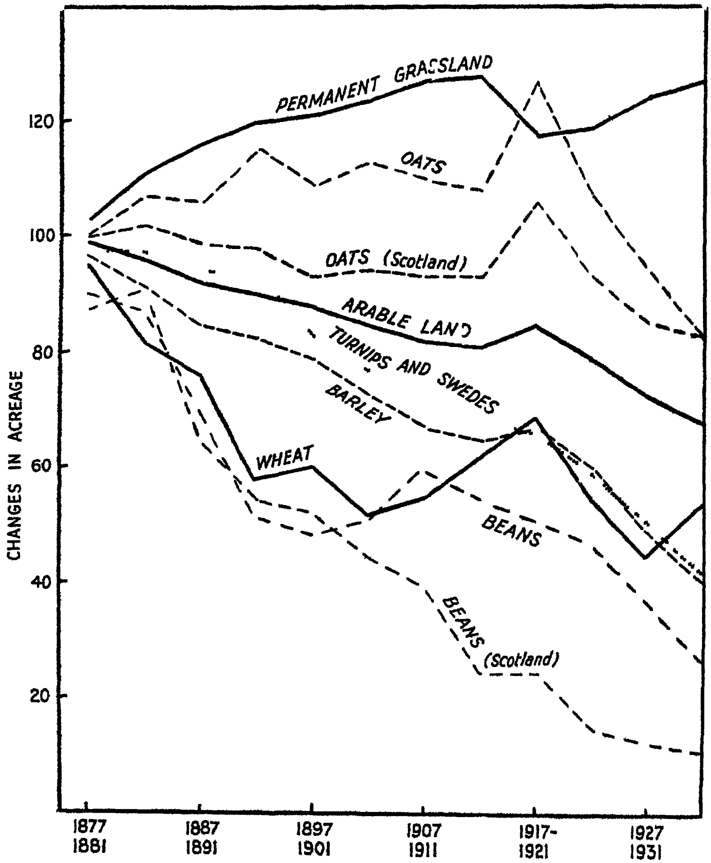


Fig 1 —*Changes in the area of arable and permanent grassland and of certain crops in Great Britain and in Scotland* (*Five year averages with the acreage of* 1877 *taken as* 100)

In one sense it is, of course, advantageous for the country to be able to import large quantities of feeding-stuffs, since, if these are relatively cheap, the consumer stands to benefit by the more economical production and, therefore, the lower prices of live stock products. There are, however, at least three reasons why too much reliance on imported feeding-stuffs must be considered an unsound policy. In the first place, such a policy makes the cost of stock feeding largely dependent on world price fluctuations. As an example, one may quote the price of maize, which has practically doubled between 1936 and 1938, and which has indirectly and adversely affected the price of most other feeding-stuffs. In the second place, the value of imports of feeding-stuffs represents a very substantial sum (equivalent to between £30 and £40 million), which, if used to increase the home production of feeding-stuffs, might provide an additional source of profit to the British farmer. In the third place, reliance on cheap imported feeding-stuffs tends to discourage the farmer from maintaining his land in the most productive state.

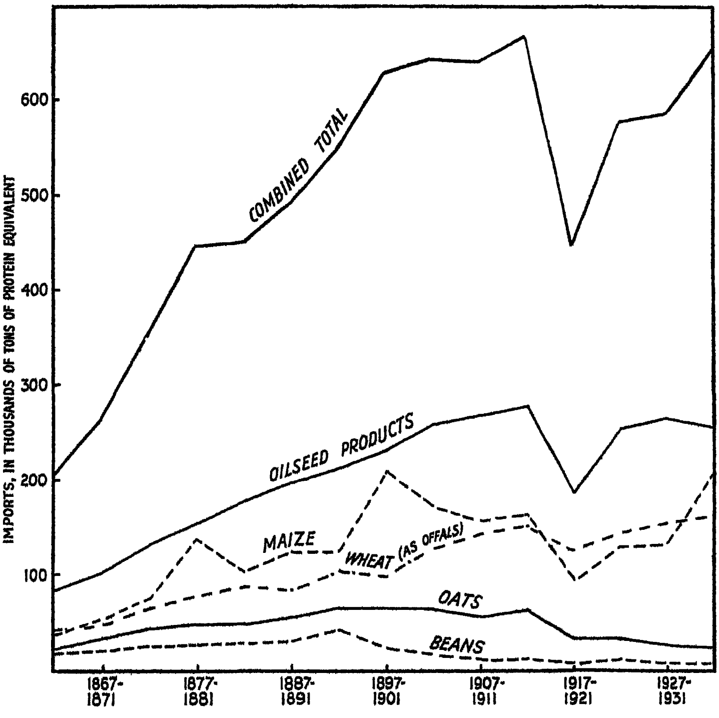


Fig. 2.—*Protein equivalent of imports of oil-seed products, maize, wheat (as offals), oats, and beans into the United Kingdom.*

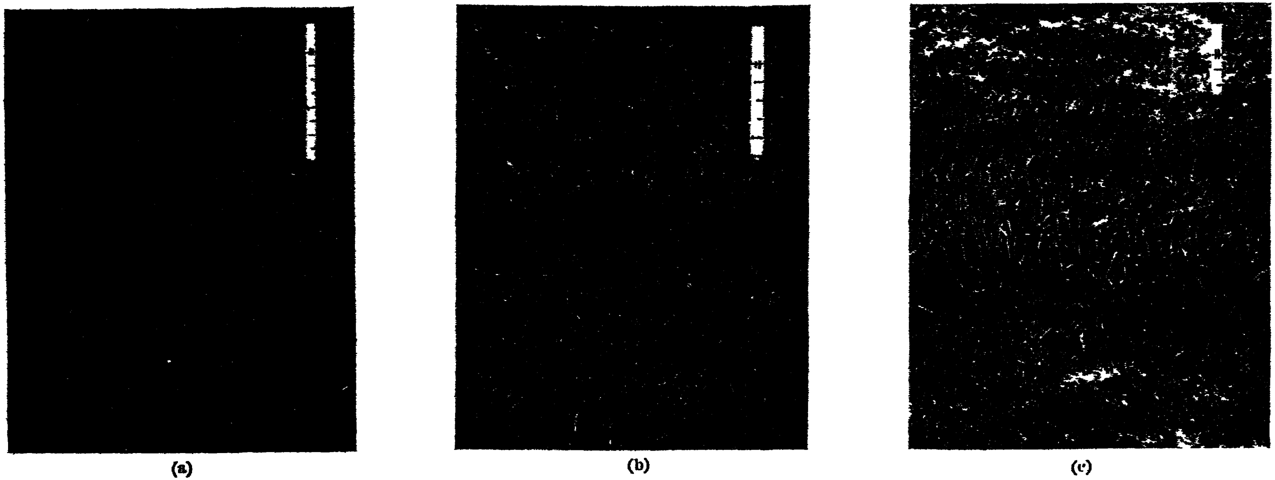
Moreover, so long as he relies on grazing as the main source of his home-produced nutrients, to the exclusion of arable cultivation, he is forced to depend largely on imported feeding-stuffs for his winter keep.

To summarise this general introduction it may be stated: first, that the nutritional requirements of the human population demand an ever-increasing production of live stock products such as milk, eggs, and meat; second, that to meet these demands it is desirable that home production should be expanded; third, that in the past such expansion has been achieved by a drift from arable to grassland farming and by a simultaneous increase in the importation of feeding cereals and oil-cakes; and fourth, that it is essential for the development of a well-balanced agricultural policy that this drift should be stopped and that steps should be taken to ensure the home production of far larger quantities of feeding-stuffs, especially of those which can be conserved for winter use.

CAN THE PRODUCTIVITY OF EXISTING GRASSLAND BE INCREASED?

In considering possible methods of increasing the proportion of home-produced feeding-stuffs it is natural to turn first to grassland, which already occupies such a vast acreage and provides such a large proportion of the nutrients available for live stock. Reference to Table I. will reinforce this point. It will be seen that permanent grassland and rough grazings provide nearly twice the nutrients contained in the whole of the imported feeding-stuffs. To put it another way, an increase in the productivity of our grassland by, say, 50 per cent would provide sufficient nutrients to enable the country to be self-supporting so far as the needs of the live stock population are concerned. How far can such an increase in the productivity of our permanent grassland be envisaged?

There is no doubt that the pastures of Great Britain are capable of very great improvement. For example, in arriving at the estimate of the total production of nutrients from permanent grazing in Table I. an average yield of only 15 cwt. of dry matter per acre has been allowed, and the composition has been placed at only 10 per cent protein equivalent and 60 per cent starch equivalent. There is ample evidence that this output could be very substantially raised. Manurial treatment alone will result in a marked increase in the yield of herbage. Experiments carried out at numerous centres throughout Great Britain have shown that an adequate dressing of lime, superphosphate, and potash, with periodic dressings of nitrogen, will not only increase the yield of dry matter by from 30 to 60 per cent, but will also raise both the



(a) (b) (c)

Fig. 3.—*The results of field experiments carried out at the Hannah Dairy Research Institute.* (a) *Original pasture; no mechanical treatment and no manuring.* (b) *Same pasture after application of 3 cwt. superphosphate, 2 cwt. of potash salts, and 2 cwt. nitro chalk per acre.* (c) *Adjacent field ploughed up and immediately re-sown with special grass mixture: same quantities of superphosphate and potash salts and 5 cwt. nitro chalk applied per acre.*

All photographs taken on same day. Measuring post marked in 3-inch divisions.

protein, calcium, and phosphorus content of the herbage.[1] The results of such treatment are clearly illustrated in Fig. 3, (*a*) and (*b*), where the growth of herbage on untreated and treated portions of the same pasture are shown side by side. It may be mentioned that larger dressings of nitrogen result in still further increases in yield, exceptionally heavy dressings having given, under suitable climatic conditions, yields as high as 5 to 6 tons of dry matter per acre.[2] In order to obtain even moderately high yields of grass over a succession of years, it is, however, essential to apply periodically some form of nitrogen in addition to mineral fertilisers. In this connection it is disappointing to find that the increase in the use of nitrogenous fertilisers in Great Britain has been relatively slow. Although during the past fifteen years there has been a progressive expansion in the annual consumption of such fertilisers (rising from 136,000 tons in 1922 to 226,000 tons in 1936) the figure is still below that of 1919.[3] The present quantity, if applied *only* to permanent grassland (and it is probable that the greater part is at present applied to arable land), would, in fact, only be sufficient to allow the application of about ¼ cwt. per acre. A very much larger utilisation of nitrogenous fertilisers will obviously be required if full use is to be made of the potentialities of our grassland.

Apart, however, from the application of manurial dressings, it is fairly generally recognised that much of the grassland of Great Britain has been allowed to deteriorate to such an extent that quick regeneration can only be secured by more drastic means — *e.g.*, by ploughing up. One method of achieving this is by the adoption of a system of 'alternate husbandry,' a system of management in which tillage and grass are alternated as the nature of the land or the comparative profits of tillage and grazing require. The system of farming practised in certain areas (for instance, in intensive dairying districts) does not, however, permit of any extensive renewal of pasture by means of even a modified system of rotation cropping. In such areas the method of renewal advocated by Stapledon [4] of ploughing up outrun leys and converting them by immediate re-seeding into high-grade pasture may be employed. This method has been tried out in Scotland by Fowler [5] and by Kirkwood,[6] with most successful results (see Fig. 3 (*c*)).

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[1] 'Improvement of Pastures.' J. A. Hanley and Others. Journ. Min. Agric. *39*, 24 (1932).

[2] 'Sixth Annual Report of the Hannah Dairy Research Institute' (1935).

[3] 'World Nitrogen Markets.' Fertiliser and Feeding-Stuffs Journ. *22*, 696 (1937).

[4] 'The Improvement of very Poor Pastures.' R. G. Stapledon. Journ. Min. Agric. *32*, 13 (1925).

[5] 'Renewal of Old Pasture.' A. B. Fowler. Scot. Journ. Agric. *14*, 439 (1931).

[6] 'The Improvement of Grass-Land by Ploughing up and Sowing out direct.' J. Kirkwood. Scot. Journ. Agric. *20*, 251 (1937).

The beneficial effect of ploughing up on the yield of grass herbage is, incidentally, also apparent from a study of the relative output per acre obtained from permanent grassland as compared with that obtained from rotation grass. As regards hay, official figures show that the yield of rotation hay is some 30 per cent higher than that from permanent grassland, the comparative figures being 28 cwt. and 22 cwt. per acre. The differences in the yields of nutrients obtained from grazing are probably very much greater: the figures given in Table I. indicate a threefold increase in the yield of nutrients from rotation grass as compared with permanent grass.

While improvements in the productivity of pastures by mechanical treatment and/or manuring is essential if full use is to be made of existing grassland, there are at least two other methods which could be usefully adopted in order to increase the yield of herbage. In the first place, steps could be taken to ensure that, in re-seeding, grasses (or combinations of grasses) are used which give the longest grazing season and provide the most leafy herbage, since the leaf contains the richest and most easily digestible nutrients. Indigenous perennial ryegrass has the longest period of leaf growth, extending (under suitable climatic conditions) from the middle of March to the end of October. Cocksfoot starts growth somewhat later, and the period of growth does not usually extend beyond September. In comparison, bent has only a three-month growing season, while nardus (the predominant grass of our poorest pastures and rough grazings) provides satisfactory grazing for little more than a month. In the second place (and complementary to the first), the yield of nutrients from pasture will depend on the system of grazing adopted. It has, for example, been shown by Martin Jones[1] that, by adopting a system of controlled grazing, the growth of the different species of grasses can be encouraged or retarded at will, and that it is possible by this means to ensure a more constant yield from the sward.

The above notes relate chiefly to the possibility of improving the output of nutrients from permanent grassland. There is no doubt that the productivity of rough grazings (of which there are some 15 million acres in Great Britain, including 10 million acres in Scotland) could also be very markedly improved. This subject is, however, too specialised to be dealt with in the present article, and for full information the reader is referred to a recent article by Stapledon.[2] It may, however, be concluded from the present discussion that a very substantial increase in the output of nutrients from the country's grassland could readily be achieved by the more widespread adoption of progressive methods of grassland husbandry.

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[1] 'Grassland Management and its Influence on the Sward.' M. G. Jones. Journ. Roy. Agric. Soc. Eng. *94*, 21 (1933).

[2] 'The Improvement of Hill Land.' R. G. Stapledon. Scot. Journ. Agric. *19*, 14 (1936).

THE CONSERVATION OF GRASS: GENERAL CONSIDERATIONS.

While improvement in the productivity of permanent grassland would add enormously to the quantity of home-produced nutrients available for the feeding of stock, the potential value of such an improvement could only be fully realised if suitable methods were available for conserving a large proportion of the herbage for winter feeding. Otherwise the great increase in the stock-carrying capacity of the land during the summer months would merely result in an increased dependence on imported cereals and concentrates for the period of winter keep. Attempts to improve the productivity of the country's grassland are therefore inevitably bound up with the development of satisfactory methods of grass conservation.

For many centuries the standard method of conserving grass has been its conversion into hay. While this produces a palatable feeding-stuff of moderate nutritive value, it has two serious disadvantages. In the first place, it is a wasteful process. The work of Watson and his colleagues [1] has shown that losses amounting to between 20 and 35 per cent of the nutrients of the cut grass may be incurred during haymaking, a result which is in agreement with the work of Continental investigators. Some of these losses are due to physical and mechanical factors; for example, exposure to rain may result in the leaching out of a part of the soluble nutrients, while handling in the field will cause mechanical losses through the breaking off of the drier leafy portions of the herbage. Other losses may be due either to respiration of the plant tissues during the prolonged period of drying or to actual fermentation in the stack. Most of these losses are outwith the farmer's control, and cannot be avoided even by the most careful handling. In the second place, haymaking necessitates the cutting of grass at a relatively mature period of growth. At this stage the protein content and the digestibility are both comparatively low, and the hay can, in consequence, only be looked upon as a type of coarse fodder, suitable for inclusion as a part of the maintenance ration but of little value for production.

In 1926 Woodman and his colleagues showed that the composition of grass herbage depended on its stage of growth, and that if it were cut at a young leafy stage, its dry matter would possess the character of a protein concentrate, such as bean meal or linseed cake, rather than that of a coarse fodder.[1] Thus the crude protein content of the dry matter was found to be well over 20 per cent, while the digestibility and the starch equivalent were also proportionately high. Moreover, these workers also showed that the richness of the young grass in nutrients was more or less independent of the botanical composition of the herbage, provided that growth was properly controlled. From this discovery arose the idea of conserving the nutrients of the young growing grass, either by artificial drying or by ensiling, and so of providing a valuable store of nutrients for winter use. It is instructive to note the comment made by Woodman himself when his original work was published :—

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[1] 'The Time of Cutting of Hay and the Losses entailed in Haymaking.' S. J. Watson and Others. Journ. Agric. Sci. 28, 224 (1937).

> "A future generation may witness the utilisation of large areas of grassland for the sole purpose of production of protein concentrate. Pastures, having the appearance of vast lawns, may be cut over regularly and frequently throughout the growing season, the nutritious, protein-rich produce being preserved for feeding to animals in winter confinement, along with balancing home-grown feeding-stuffs like meadow hay, cereals, and roots. The mode of preservation may either be artificial drying, followed by pressing into cakes or grinding to the roughly powdered form, or it may consist in ensiling the freshly cut grass."

Subsequent investigations have fully confirmed Woodman's earlier results and have shown the very high feeding value of the conserved product, whether this is produced by artificial drying or by ensiling. For a detailed account of the uses of dried grass in stock feeding reference may be made to an excellent brochure by Watson,[2] while details of the composition and nutritive value of grass silage have also been published by the same author.[3] It would not, however, be out of place to draw attention in the present article to the fact that, apart from the relatively high percentage of protein in these grass products, the quality of the protein which they contain makes them specially suitable for inclusion in the production rations of live stock. Table III., which is taken from a recent paper which deals with the value of various proteins for milk production,[4] not only shows the general superiority of proteins derived from home-produced products over those derived from some typical imported concentrates, but demonstrates the exceptionally high quality of the proteins of grass and grass products.

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[1] 'Nutritive Value of Pasture.' H. E. Woodman and Others. Journ. Agric. Sci. *17*, 209 (1927).

[2] 'Feeding Artificially Dried Grass.' S. J. Watson. Published by the Fertiliser and Feeding-Stuffs Journ. (1937).

[3] 'The Chemical Composition of Grass Silage.' S. J. Watson and W. S. Ferguson. Journ. Agric. Sci. *27*, 1 (1937).

[4] 'The Nutritive Value of Proteins for Milk Production.' Part IV. S. Morris and Others. Journ. Dairy Res. *7*, 97 (1936).

TABLE III. RELATIVE BIOLOGICAL VALUES OF PROTEINS DERIVED FROM CERTAIN TYPICAL FEEDING-STUFFS.

Biological Value.	Feeding-Stuff.
75-80 per cent .	Fresh, dried, and ensiled spring and summer grass. Low-temperature dried blood meal.
60-65 per cent .	Fresh and dried autumn grass. Bean meal and pea meal.
55-60 per cent .	High-temperature dried blood meal. Meat Meal.
50-55 per cent .	Decorticated earth-nut cake. Decorticated earth-nut cake, plus flaked maize.
45-50 per cent .	Linseed cake. Linseed-oil meal.

TABLE IV. COMPARISON OF CRUDE PROTEIN CONTENT OF DRIED GRASS AND DRIED LUCERNE.

Crude protein content.	Dried grass.	Dried lucerne.
Below 11·0 per cent	6	..
11·0-13·9 ,, ...	20	..
14·0-16·9 ,, ...	37	3
17·0-19·9 ,, ...	23	54
20·0-22·9 ,, ...	8	27
Above 23 ,, ...	6	15
	100	100

THE PRODUCTION OF ARTIFICIALLY DRIED GRASS.

The proposal that the nutrients of young grassland herbage might be conserved by a process of artificial drying is based on the assumption that the additional costs involved in cutting and collecting the herbage and in drying the product would be more than off-set by its remarkably high nutritive value—that its value would, in fact, be equivalent to that of a typical protein-rich concentrate such as bean meal or linseed cake. It is obvious, however, that the cost of production of artificially dried grass will depend on many variable factors. Some of these are associated with the locality in which the plant is situated; for example, the cost of fuel varies markedly in different parts of the country, while the cost and availability of labour also shows relatively wide variations from district to district. Others are dependent on the actual situation of the farm concerned, on the ease of transport of fresh grass from the fields to the drier, and on the access of the farm to suitable markets where surplus dried grass can be disposed of. Others, again, depend on the size of the holding and the acreage to be allotted to grass-drying, since this will influence the method of cutting and collecting the herbage and the capacity and design of the drier.

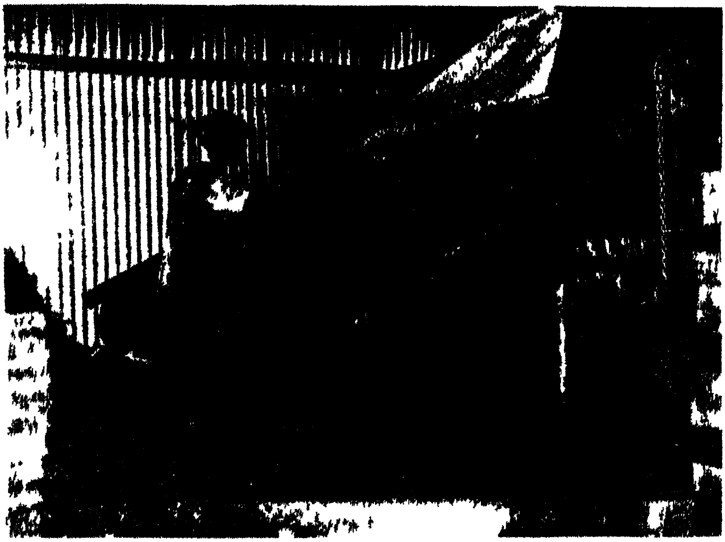

Fig. 4.—*Ransome Grass Drying Machine installed at the Hannah Dairy Research Institute. (Feed end, showing elevator with furnace on right.)*

The amount of information which is available regarding the various types of drier on the market, and their relative capacities and costs, is now so extensive that it would be impossible to deal with them in detail in the present article; full information on the subject is available in recent publications by Roberts,[1] Cheveley,[2] and others. All that can be done here is to indicate some of the more important points which will need to be taken into consideration in any attempt to forecast the probable lines of future development of artificial grass-drying. These points may be summarised as follows :—

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[1] 'Grass Drying.' E. J. Roberts. Agricultural Research Council Report. Published by H.M. Stationery Office (1937).

[2] 'Grass Drying.' S. W. Cheveley. Published by Ivor Nicholson and Watson (1937).

(1) It is essential for the prospective producer of dried grass to have clearly in mind the scale on which he proposes to undertake grass-drying. If he only desires to produce sufficient dried grass to meet the nutritional requirements of his own stock (assuming that he has, say, a dairy herd of 50-100 head), a plant with a total capacity of about 50 tons per season would be adequate. The actual quantity of high-grade dried grass (*i.e.*, of grass containing 18 to 20 per cent crude protein) required for milk production on such a farm would be less than this ; for an average daily yield of 50 gallons of milk only about 12 to 15 tons of such high-grade material would be needed, but the farmer might also use his plant to provide a supply of 'super-hay,' which would not only be of higher nutritive value than ordinary hay, but would enable him to harvest his grass successfully independent of weather conditions. If the farmer desires, however, to produce sufficient dried grass to enable him to sell part of his output, a plant of two or three times this capacity would be required. If, finally, he intends to specialise in the production

Fig. 5.—"*P. & M.*" *Grass Drying Machine installed at the Hannah Dairy Research Institute.* (*Delivery end, showing automatic stoking and thermostatic control.*)

and sale of dried grass, a really large plant, or even a plant designed for production on a factory scale, would be needed.

The main reason why it is essential for the prospective producer to have clearly in mind his objective in undertaking grass-drying and the scale on which he intends to work is that his output of dried grass will have to bear the full burdens of interest and depreciation on the capital cost of his plant and equipment. At present the cost of depreciation, chiefly due to obsolescence, is relatively high. M'Nair [1] has estimated that, including expenditure on the equipment required for cutting and collecting the fresh herbage and on providing adequate storage accommodation for the baled product, a plant of average capacity will involve a capital outlay of as much as £1800. In order to obtain a reasonable financial return from his land and at the same time meet those charges, a farmer who had invested this capital sum in grass-drying equipment would need to produce annually at least 250 tons of the dried product. M'Nair's calculation is, moreover, based on an average cost of production of £6, 5s. per ton and an average selling price of £8, 10s. per ton. The former figure (although based on a recent authoritative publication [2]) seems likely to be too low; figures have since been quoted which place the costs of production as high as £8.[3] A selling price of £8, 10s. assumes, too, that the whole of the output of dried grass is of exceptional high quality, a result which is seldom likely to be achieved under practical conditions. At present it may be possible to sell poor quality

Fig 6.—*Production of dried lucerne on a factory scale A general view of the drying plants installed by British Crop Driers, Ltd, at their South Acre Drying Station.*

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[1] Personal communication from Mr J. M'Nair.

[2] 'Grass Drying a Study of Production Costs' R. N. Dixey and R. P. Askew. Published by Agricultural Economics Research Institute, Oxford (1937)

[3] 'Grass-drying Prospects.' G. B. Hony. Fertiliser and Feeding-Stuffs Journ. *23*, 91 (1938).

material at a relatively high price on account of its 'novelty' value; but as the country's total production increases, the price-level will be automatically adjusted to correspond to the true nutritive value of the product. The above facts serve, at any rate, to show the burden which heavy initial capital expenditure throws on to grass-drying, and demonstrates clearly that it is essential to limit such capital expenditure to an absolute minimum unless the annual output of the plant is a large one. Obviously for a 50-ton output very cheap plant and equipment would need to be employed; a drying plant costing not more than, say, £300 and the use of horse labour and of ordinary farm equipment in cutting and collecting the herbage would probably be essential. On the other hand, for a high output, where interest and depreciation charges can be spread over a large tonnage, it would obviously be desirable to reduce running costs by making every possible use of mechanised labour—a practice which is typical of all modern industrial developments.

(2) The marked seasonal growth of grass introduces two fundamental difficulties which cannot readily be overcome. The first difficulty is due to the seasonal variations in the *quantity* of herbage available for drying. At the 'flush' period growth is at least twice as rapid as at other periods of the growing season, and similar though less violent fluctuations in growth are not infrequently encountered at other times through vagaries of climate. As a result, the prospective producer has to choose one of two alternatives. Either he has to purchase drying plant and equipment capable of coping with the maximum output of grass likely to be encountered in the 'flush' period, in which case his plant will only be running to full capacity for a small part of the season; or he has to select plant and equipment which is only sufficient to cope with the average growth during the greater part of the season, in which case he is faced with the loss of much valuable young herbage in the 'flush' period. Such herbage (which under normal growing conditions probably constitutes well over half the season's total output) has consequently to be conserved in some other form, and is most frequently allowed to grow to an early hay stage. But this in turn results not only in diminished yields but in the production of an inferior product on subsequent cutting. It is true that growth can to some extent be evened out by the judicious application of fertiliser; but the work of Page [1] shows clearly that climate exerts an influence which can largely nullify the effect of the most carefully planned manurial treatment.

(3) The second difficulty which is associated with variations in the rate of growth of herbage is the fact that these result

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[1] 'The Influence of Manuring and other Factors on the Productivity of Pastures.' H. J. Page, 3rd Grassland Conference, Switzerland (1934).

in marked changes in the *quality* of the herbage, even a few days' growth being capable of reducing the crude protein content of growing grass from, say, over 20 per cent to between 12 and 15 per cent. As a result, it is extraordinarily difficult to turn out a dried product of uniform high quality. The middle column of Table IV. shows, for instance, a series of typical analyses of samples produced at one centre during a recent season. It will be seen that the crude protein content varied from under 11 per cent to over 23 per cent, the extreme values actually being 10·8 per cent and 26·6 per cent. Although every effort was made at this centre to produce a high quality product, only 14 per cent of the samples examined contained more than 20 per cent crude protein, while 26 per cent contained less than 13 per cent of crude protein. Moreover, owing to the very rapid growth of the herbage at the 'flush' period, it was found necessary to make more than 20 tons of hay from fields originally set aside for grass-drying. Such variations in the composition of the dried product through fluctuations in the rate of growth not only cause direct financial loss (*e.g.*, where heavy applications of manure have been made in the expectation of obtaining high yields of good quality dried grass), but are responsible for the disappointing results which are occasionally reported by those who have conducted feeding trials in which dried grass was one of the main constituents of the production ration.

It has been suggested that these marked variations in protein content might be avoided by using a crop such as lucerne, which does not exhibit such marked seasonal fluctuations in growth and composition. The superiority of lucerne in this direction is, indeed, apparent from the figures shown in the right-hand column of Table IV.; it will be seen that 97 per cent of the samples contained more than 17 per cent of crude protein, while over 40 per cent contained more than 20 per cent of crude protein. Even under the relatively favourable climatic conditions of the South of England the cultivation of lucerne is not, however, easy. This is partly due to the absence from the soil of the appropriate nodule bacteria, but it is also attributable to weed infestation as a result of unsuitable soil conditions or incorrect husbandry.[1] The difficulties associated with lucerne cultivation in this country are reflected in the marked reduction which has taken place in the acreage devoted to lucerne, the five-year averages since 1907 being as follows :—

1907-11	61,185 acres	1922-26	54,838 acres
1912-16	54,910 ,,	1927-31	40,505 ,,
1917-21	44,150 ,,	1932-36	36,510 ,,

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[1] 'Suggestions to Lucerne Growers.' H. G. Thornton and H. Nicol. Journ. Min. Agric. *39*, 46 (1932).

Moreover, lucerne growing appears in any event to be out of the question in Scotland; the average area devoted to this crop during the past ten years has been less than 20 acres. It is clear, therefore, that so far as artificial drying is concerned the use of lucerne in place of grass would not provide a practical solution of the difficulties outlined above.

One further point might be mentioned. It has been suggested that one mėthod of popularising grass-drying would be the use of a travelling type of drier, which could be moved from farm to farm in the same way as a thrashing-mill. This suggestion entirely fails to take into account the rapid seasonal changes in the rate of growth of grassland herbage. The difficulty involved in obtaining a uniformly high quality product even when operations are confined to a single farm (as illustrated in Table IV.) shows clearly the impracticability of successfully employing mobile driers designed to travel from farm to farm.

(4) Apart from the general difficulties outlined in the preceding paragraphs, there are certain special problems involved in the practical running of a grass-drying plant. It is easy to demonstrate on paper how the process can be economically carried through; in practice it is not so simple. A number of the practical difficulties that are apt to be encountered are detailed in a recent paper by Fowler[1]; brief reference may be made to a few of these.

Owing to the intensive nature of the cutting operations, the life of the cutting and collecting machinery is relatively short. The machines not only have to withstand excessive wear and tear through having to cut so near to ground level, but they have to bear an undue strain through the excessive weight of herbage at the 'flush' periods. Any breakdown in the machines does not, moreover, merely involve expenditure on depreciation and repairs; if the breakdown is sufficiently serious to cause a complete stoppage of work at the drier there is an inevitable wastage of fuel and a still greater loss through labour being thrown idle. This will result in markedly higher production costs. Again, while it is frequently stated that a grass-drying plant can be successfully run by ordinary farm labour, practical experience shows that continual supervision of the process by a skilled overseer is essential if the output of the plant is to be maintained. Moreover, faulty regulation of the heating, bad stoking, and inefficiency in examining the dried grass as it leaves the plant can easily lead to very considerable losses through reduction in the value of the product.

The various practical considerations noted above must be taken into account in any attempt to forecast the future development of grass-drying. The first essential in attempting to develop any such project is to determine the nature of the difficulties which are likely to be encountered under practical conditions. In regard to grass-drying it may be stated that this first stage has now been reached. Although the difficulties are formidable they should not prove insuperable. Increased experience in the management of grassland, better methods of dove-tailing the production of dried grass with grazing and with haymaking and other methods of grass conservation, the formulation of improved designs of cutting and collecting equipment and drying plants—all these should play their part in enabling artificial grass-drying to be placed on a more economic basis. But until the above difficulties have been faced and successfully overcome, grass-drying is unlikely to develop on a large scale.

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[1] 'Grass Drying.' A. B. Fowler. Scottish Farmer *45*, 1566.

Finally, therefore, it will not be out of place to refer briefly to the scale on which grass-drying would need to be undertaken if it were to be successfully employed as a means of replacing a substantial part of the feeding-stuffs at present imported into this country from abroad. According to Table I. the protein equivalent of imported concentrates (*i.e.*, excluding cereals) amounts to some 340,000 tons. In order to replace the whole of this quantity of protein with dried grass it would be necessary to produce roughly two million tons of dried grass having a crude protein content of 20 per cent. On the assumption that the average output of a grass-drying plant on a moderately sized holding would be 100 tons per season (a somewhat generous estimate), it would be necessary to envisage the establishment of at least 20,000 drying plants in Great Britain, involving a total capital expenditure of not less than £10 million. A development of this magnitude can hardly be anticipated for many years.

THE MAKING OF GRASS SILAGE.

In view of the fact that grass drying is unlikely to be widely adopted until the many difficulties involved in the process have been overcome, the question arises as to whether some other less ambitious method might meantime be employed—particularly by smaller farmers—in an attempt to conserve the nutrients of young grassland herbage for winter feeding. It appears that modern methods of ensiling provide such an alternative. The high nutritive value of properly made grass silage has already been mentioned, and reference to Table III. shows that the protein of such silage has a biological value as high as that of either fresh or dried grass. Moreover, the conservation of grass by ensiling has one great advantage over drying, in that (provided adequate silos are available) there is no serious difficulty in coping with the 'flush' periods of growth in the spring and early summer.

Silage-making is not, of course, a modern development. It is, indeed, interesting to note that actual records of the number and type of silos in Great Britain are included in the official Agricultural Statistics between 1884 and 1889, and it is remarkable to find that during this five-year period there was more than a fourfold increase in the number and capacity of silos, which totalled just under 3000 by 1889. Unfortunately, similar statistics do not appear to be available regarding the position at the present time. It is, moreover, also interesting to find that at the request of Parliament a publication was issued in 1885 detailing the collected experience of most of those who had installed silos.[1] Many of the essentials of good ensiling were already recognised; in particular, stress was laid on the necessity of excluding air by thorough pressing of the ensiled material, and the use of 'super-silos' (now usually termed 'over-silos') as a method of overcoming shrinkage difficulties was also referred to. It may be mentioned, too, that more than half the silos in use were described as either partly or wholly below ground, and the convenience of placing the silos on sloping ground, where they are readily accessible to cartage, was also noted. It might be mentioned also that in the summary of the report the statement is made that "meadow grass, clover and aftermath appear to have been generally preferred for the making of silage."

Neither silage-making nor the ensiling of grass are, therefore, novel developments. Recent systematic studies of the process have, however, directed attention to two essential features in the production of high-class grass silage. The first (to which general reference has been made in a previous section of this article) is the necessity of ensiling grass at its most leafy stage of growth. This not only ensures a high protein content in the finished silage, but provides a material of relatively high moisture content which is specially suitable for ensiling. The second is the fact that, in order to prevent undesirable fermentation in the silo, it is necessary for the contents to be relatively acid in reaction. To ensure that the required degree of acidity is obtained two methods have been devised: in one (the so-called A.I.V. process) a mineral acid mixture is sprayed over the grass during ensiling; in the other a quantity of diluted molasses is similarly used. The addition of the molasses encourages acid fermentation, and thus has the same effect as direct addition of mineral acids. It appears, in fact, to be the preferable method, since it is frequently found difficult under practical farm conditions to adjust satisfactorily the quantity of mineral acid to be employed.

As regards the capital expenditure entailed in the construction of silos, it should be made clear that small portable or pit silos are quite as satisfactory as tower silos; in fact, if grass silage is being made at intervals throughout the season they are preferable to tower silos. Portable silos can, too, be erected on the actual field which is being cut, a point of distinct advantage if the herbage is growing rapidly and cutting and carting require to be completed in a minimum of time. Such silos are also particularly suitable where stock are kept on a movable 'bale' system. The making of silage in stacks cannot, however, be recommended; the losses which occur through the deterioration of the outer layers of such silage are inevitably very considerable. Moreover, in any event the costs of portable or pit silos are relatively small. Wooden silos (the walls of which should be tongued and grooved to prevent access of air) of about 20 tons capacity can be constructed for roughly £10 (see Fig. 7). Such silos may either be partly sunk into the ground or may be set up above ground. They should have a life of about eight years. Concrete pit silos (with wooden over-silos) will probably cost 50 to 80 per cent more than wooden silos, but should have a longer life. They are not, however, portable, and are almost invariably partly sunk into the ground (see Fig. 8).

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[1] 'Return of Replies to Questions relating to Silos and Ensilage.' Published by Eyre & Spottiswoode (1885).

Fig. 7.—*Filling a wooden sectional silo at Jealott's Hill. The oversilo has not yet been attached.*

It will be seen that the capital cost involved in ensiling grass is considerably less than that involved in artificial drying. Ensiling also avoids the high running costs involved in removing the very considerable percentage of moisture from the young herbage. For farmers of moderate means there is no doubt that these and other advantages make it meantime the most economic and practical method for conserving grass for winter feeding.

AN EXAMPLE OF A SELF-SUPPORTING DAIRY HERD.

Any discussion of the possible methods of improving the productivity of grassland and of conserving grass for winter feeding would be incomplete without brief reference to a recent attempt to determine the extent to which a farm might become self-supporting by making full use of its grassland herbage.[1] The farm concerned was situated in a first-rate grazing district. It possessed a herd of some 100 head of cattle and produced an average of about 100 gallons of milk per day. For a period of three years an endeavour was made to run the farm on a system which included the preservation of surplus summer grass by drying and ensiling as well as by its conversion into hay. The results for a typical season (1935) are shown in Figs. 9 and 10.

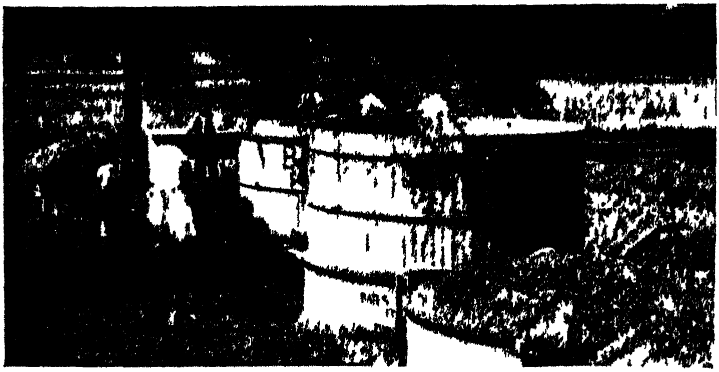

Fig. 8.—*Filling concrete silos at Jealott's Hill. The photograph shows the final stage of filling the wooden oversilo. A completed silo after settlement may be seen in the foreground.*

Fig. 9 illustrates the seasonal variations in the production of grass (expressed in terms of crude protein). It will be seen that growth increased rapidly between April and June, with the result that during the months of May, June, and July there was about three times as much grass as was required for grazing. In May this surplus was converted into artificially dried grass, in June it was necessary in addition to make both silage and hay, while in July most of the surplus was used for hay. In the late autumn the surplus aftermath was also used for the production of dried grass. Taking the full year's output of grass, grazing accounted for 46 per cent, dried grass for 32 per cent, hay for 20 per cent, and silage for 2 per cent. Fig. 9 provides an admirable illustration of the way in which grazing and the various methods of grass conservation can be dovetailed.

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[1] 'Grass and the National Food Supply.' R. E. Slade. Annual Report Brit. Assoc. Adv. Sci. (1937).

Turning now to Fig. 10, which shows the consumption of feeding-stuffs on the farm, it will be seen that (as might be anticipated) grazing provided practically all the necessary nutrients between May and July. During the remaining months, when supplementary feeding was essential, hay and dried and ensiled grass provided by far the greater proportion of the rations. Taking the figures for the complete year, grazing provided 46 per cent of the nutrients, dried and ensiled grass provided 24 per cent, hay 20 per cent, roots and green fodder 6 per cent, and ‘ other foods ’ only 4 per cent of the total. In addition nearly one-third of the dried grass produced was available for sale. On most dairy farms it may be assumed that ‘ other foods ’ (including imported feeding-stuffs) would provide at least 30 per cent of the total nutrients.

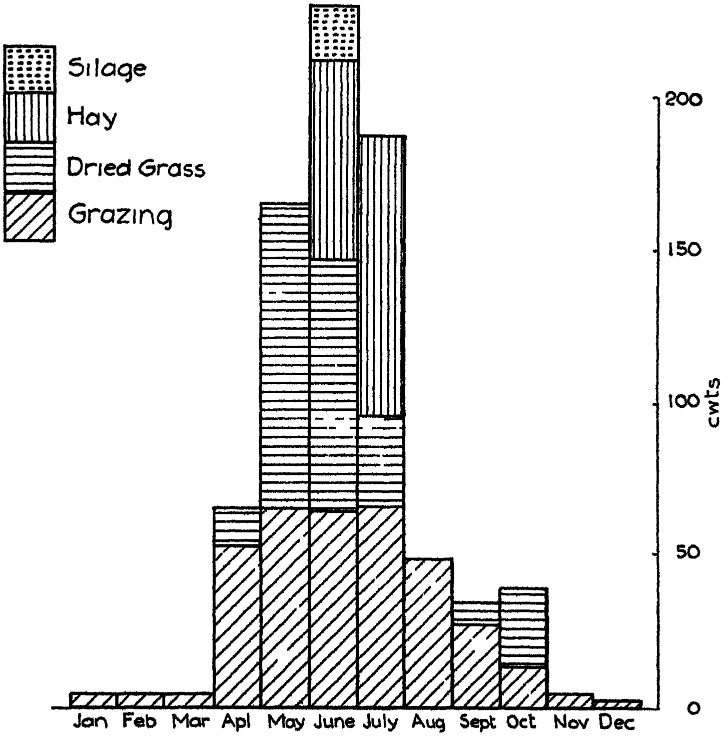

Fig 9.—*Diagrammatic representation of the production of grass and grass products at Dairy House, Cheshire, during* 1935, *demonstrating the way in which grass conservation is dovetailed with grazing.* (*Figures refer to cwt. of crude protein.*)

The experience on this farm provides, therefore, a most striking example of the potentialities of improved grassland husbandry and of grass conservation in making this country less dependent on imported feeding-stuffs.

The Desirability of Increasing the Acreage under Arable Cultivation.

The factors responsible for the reduction in the acreage of arable land during the last sixty years have already been discussed. Fig. 1 shows that this acreage has fallen since 1877 by over 30 per cent—from 18 to 12 million acres. Such a reduction in the area under arable cultivation has seriously affected the supply of home-produced cereals (as well as of roots, straw, and green fodder) available for the feeding of stock, and particularly for winter feeding. If a determined effort is to be made to increase the proportion of home-produced feeding-stuffs, it will be essential to return at least part of our present area of permanent grassland to arable cultivation. It would be outwith the scope of this article to attempt any discussion of the economic problems involved in such a policy, but it appears desirable to indicate briefly

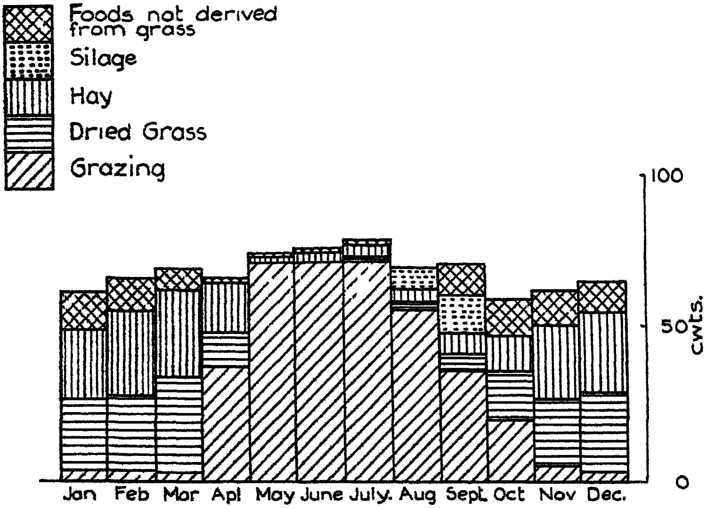

Fig. 10.—*Diagrammatic representation of the rations fed at Dairy House, Cheshire, during* 1935, *demonstrating the potentialities of grass products as a source of nutrients for milk production.* (*Figures refer to cwt of crude protein*)

the extent to which the output of various crops might be increased and the significance of such increases in relation to the total supplies of feeding-stuffs.

Oats.—The oat crop is by far the most important from the point of view of the feeding of stock. Of the total output of home-produced feeding cereals (*i.e.*, excluding wheat used for human consumption but including wheat offals), oats account for roughly two-thirds. Moreover, home-produced oats contribute over 90 per cent of the total available supplies of this cereal, the imports of oats amounting to less than 200,000 tons as compared with a home output of over 2 million tons. During the past twenty years there has, however, been a marked reduction in the demand for oats. This is partly attributable to the smaller number of horses now used on agricultural holdings [1] and partly to the increased use of other classes of imported cereals, and particularly of maize, for stock feeding. Maize is specially popular among those stock feeders who make liberal use of imported protein-rich concentrates, since it is a cereal of remarkably high carbohydrate content and is therefore of special value in balancing the nutrients of a production ration. If grass conservation were to be developed on a large scale and the home production of crops (such as beans) containing a relatively high protein content were to be encouraged, the demand for oats, which contain a rather higher protein content and a lower carbohydrate content than maize, might be expected to increase substantially. A return to the level of oat production of 1916-20 (which was stimulated by war measures) would increase the present output by 33 per cent, but this would only be sufficient to replace a little over a quarter of the nutrients at present provided by imported maize.

Wheat and Barley.—Wheat used for feeding, wheat offals and barley together provide about half the total nutrients supplied by oats. The acreage of both these crops has fallen by 50 per cent during the past sixty years, though the area under wheat showed a temporary recovery between 1900 and the peak war year of 1918. Although, as a result of the wheat subsidy, there has been a marked increase in the home output of wheat since 1930, this has been insufficient to affect very materially the supply of wheat offals for stock feeding, the great bulk of such offals being derived from imported wheat. The home production of barley accounts for roughly half the total supplies of this cereal which are available for stock feeding. It is unlikely that the acreage under this crop could be substantially increased without the adoption of a drastic measure of protection: it is significant that the production of barley during the war period showed only a slight recovery, which was quickly dissipated in the immediate post-war years. Any substantial increase in the home production of feeding-stuffs is, therefore, unlikely to be achieved through increased cultivation of either wheat or barley.

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[1] 'Agricultural Statistics' (1935). Part I., pp. 10-14. Published by H.M. Stationery Office (1936).

Beans.—The acreage under beans (about 150,000 acres) is relatively small, and the output of this crop has, as has already been stated, fallen off seriously during the past sixty years. It is significant to note that the imports of beans have also been substantially reduced during the past twenty years. The total supplies available for stock feeding from all sources amount to about 100,000 tons, of which 80 per cent are home produced. Although the tonnage of this crop is relatively small, its importance lies in the fact that of all home-grown feeding-stuffs beans are the richest in protein, containing about 20 per cent of protein equivalent. Moreover, reference to Table III. shows that beans contain proteins of relatively high biological value, a fact which enhances their importance as a source of protein for live stock. If the future policy of the country is to become more self-supporting in regard to supplies of feeding-stuffs, this crop must receive more attention than it has been given in the past.

It is not easy to account for the very marked decrease which has occurred in the home cultivation of beans, and particularly their cultivation in Scotland. Evidence of this decrease is not only available in the fall in acreage and output, but also in the sale of seed beans; figures obtained from one Scottish firm show a reduction of 90 per cent in their turnover of seed beans between 1911-16 and 1931-36. The decrease is, of course, partly attributable to the general decline in arable farming, and is also stated to be partly due to the serious damage caused by the bean aphis.[1] But probably the most important factor is that of cost, beans being usually rather higher in price than equivalent imported concentrates. It must not, however, be overlooked that bean cultivation supplies an intangible asset to the farmer through the increase which the crop imparts (in common with all legumes) to the fertility of the soil; it is possible that, if this fact was given greater emphasis, the value of beans as a source of home-grown protein would be more widely appreciated by farmers.

Soya Beans.—The very high protein content of the soya bean (the cake of which contains about 37 per cent protein equivalent) has led to the suggestion that this crop might be cultivated in Great Britain. Already the imports of soya beans are considerable, amounting to about 150,000 tons per year: and its use as a stock feed is rapidly increasing in countries overseas. The earliest attempt to introduce soya bean cultivation into this country appears to have been made by Hendrick at Aberdeen some thirty years ago. Since that date many other workers have endeavoured to select a variety which would give satisfactory yields under the rather rigorous climatic conditions of Britain. An account of these attempts may be found in two recent monographs [1] and in a review by Russell.[2] There is no doubt that, under carefully controlled conditions and with specially selected varieties, reasonably satisfactory yields can be obtained in certain areas of Britain, but the general experience of growers appears to be that these are not so promising as to justify the displacement of ordinary crops by soya beans. Attempts to breed improved varieties are still continuing,[3] but meantime the results cannot be described as encouraging. It is, indeed, doubtful whether it would ultimately be practicable, especially in Scotland, to attempt to compete with imported soya beans which are grown under ideal climatic conditions and in countries where farm labour is exceptionally cheap, notably China and Manchuria. In this connection it is significant to note that, of the world's total production of this crop, less than half of one per cent is grown in European countries, although the latter possess a far more favourable climate for soya bean cultivation than Great Britain.

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[1] 'Bean Meal for Dairy Cows.' A. C. M'Candlish. West of Scot. Agric. Coll. Bull. 112 (1928).

Roots and Green Crops.—It has already been stated that the acreage under roots is seriously falling off. This is not only due to the general decline in arable farming but to the fact that roots are becoming less popular as a food for stock, and particularly for dairy cattle. Roots are essentially carbohydrate-rich foods, and although they constitute a valuable source of energy for certain classes of stock, they supply comparatively little protein to the ration. This point is clearly shown in Table V. It will be seen that the crude protein content of the dry matter of turnips and mangolds is only 11 to 12 per cent, which (on account of the high proportion of non-protein nitrogenous substances in roots) will correspond to the very low protein equivalent of between 3 and 6 per cent. There are, however, other green crops which are equally suitable for winter forage but which are markedly richer in protein. Among these, cabbage and kale are particularly valuable on account of their leafy nature. Typical analyses of these crops, which are also included in Table V., show a crude protein content of 16 to 17 per cent and a protein equivalent two or even three times as high as that of roots.

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[1] 'The Soya Bean.' E. Bowdidge. Published by Oxford University Press (1935).

'All about the Soya Bean.' G. D. Gray. Published by Bale, Sons & Danielsson, Ltd. (1936).

[2] 'The Culture of the Soya Bean in England.' Sir E. J. Russell. Journ. Min. Agric. 43, 24 (1936).

[3] 'Annual Report of the Scottish Society for Research in Plant Breeding' (1936).

During the past few years there have been indications that green forage crops of this type are gaining in popularity, the acreage under such crops having been more than doubled between 1932 and 1936. Although they are not equal in nutritive value to young grassland herbage, there is no doubt that they form a valuable source of nutrients, and particularly of protein, for early winter feeding.

TABLE V. COMPOSITION AND FEEDING VALUE OF WINTER FORAGE CROPS.

Dry substance in green crop.	Crop	Composition of dry substance in crop					Protein equivalent per 100 lb. dry substance	Starch equivalent per 100 lb dry substance
		Protein	Oil.	Carbohydrate	Fibre	Ash		
Per cent		Per cent.	Per cent	Per cent	Per cent.	Per cent	lb.	lb.
12·0	Mangolds . .	8·4	0·8	78·3	5·8	6·7	3·3	51·7
8·5	Turnips . .	11·7	2·3	67·1	10·7	8·2	4·7	51·8
15·3	Cabbage . .	16·3	4·6	52·9	15·7	10·5	9·8	62·2
14·3	Marrow-stem kale	16·8	1·4	44·7	26·6	10·5	10·7	62·3
14·8	Thousand-headed kale.	17·0	2·0	58·7	11·5	10·8	11·2	60·0

THE HOME PRODUCTION OF PROTEIN-RICH BY-PRODUCTS.

Table I. divides home-produced feeding-stuffs into three classes—grassland and grassland products, products of arable farming, and certain miscellaneous by-products. The latter category only contributes a relatively small fraction of the total available nutrients, but it is important in that it constitutes the sole source of home-produced protein-rich concentrates. Moreover, apart from brewers' and distillers' grains, the feeding-stuffs included in this category are derived from animal sources, and it is now generally recognised that the proteins contained in such by-products are of special value in the nutrition of live stock. It is obviously desirable, therefore, that all possible steps should be taken to increase the output of these products. It is difficult to determine what is the maximum output which might be obtained, but the following notes provide some indication of the extent of the potential supplies.

As regards by-products derived from meat, it is probable that the output of meat meal and of meat-and-bone meal has already reached a maximum. On the other hand, the output of blood meal is unsatisfactory as regards both quantity and quality. Properly prepared blood meal is undoubtedly the finest known source of protein for stock feeding. It is therefore unfortunate that much of it is handled and manufactured under such unsatisfactory conditions that it is classed as 'inedible' and is only of value as a fertiliser. There is no doubt that the output of edible blood meal could be substantially increased. A special inquiry recently undertaken by the author shows, for instance, that the present output of blood meal in Scotland approximates 600 tons, although a rough calculation from abattoir statistics indicates that the quantity of blood available would be adequate to produce nearly double this quantity. If a similar calculation were applied to the whole of Great Britain the potential output would approximate 6500 tons, although the estimated output is probably not more than 3000 tons. Again, most of the blood meal at present produced is subjected to relatively high temperature processing during manufacture. Recent investigations [1] show that such treatment has a marked detrimental effect on the biological value of the blood proteins, and that for the manufacture of the best quality product low temperature drying is essential—a point which is clearly shown in Table III.

Turning to fish meal, it may be stated that supplies for stock feeding are at present largely confined to so-called white-fish meal. The home production and consumption of this product has increased very substantially during recent years, the comparative figures for 1913 and for 1934-37 being as follows [2] :—

	1913.	1934-35.	1935-36.	1936-37.
Home production . .	40,000	42,111	61,764	69,254
Home sales . . .	10,000	36,740	57,431	64,811
Export sales . . .	30,000	4,551	8,172	7,212

In addition to the quantities noted above, about 6000 tons of white-fish meal are imported from abroad. It is impossible to determine whether the home output of this product is likely to increase still further, since the effect of restrictions on sailing at certain ports cannot be forecast. But the above table shows clearly the extent to which farmers in this country have learnt to appreciate the value of white-fish meal. The advantages of this product as a food for all classes of live stock have been summarised in a recent Bulletin.[3]

Herring meal also offers a potential source of valuable nutrients, and particularly of good quality protein, for stock. The commercial utilisation of herring meal depends, however, on the elimination of the objectionable oil which is present in the crude product and also of its high salt content. At present this forms a serious set-back to the development of large-scale herring meal production. Investigations are, however, being undertaken in an attempt to overcome the technical difficulties, and if these can be surmounted there is no reason why the material which is now looked upon as an undesirable offal should not take its place as a feeding-stuff of high nutritive value.

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[1] 'The Nutritive Value of Proteins for Milk Production.' Part IV. S. Morris and Others. Jour. Dairy Res. 7, 97 (1936).

[2] Personal communication from Dr J. F. Tocher.

[3] 'White-Fish Meal as a Food for Live Stock.' H. E. Woodman. Min. Agric. Bull. 63 (1937).

SUMMARY.

An attempt has been made to estimate the origin and quantities of feeding-stuffs at present available for the nutrition of the country's live stock. It appears that some 60 per cent of the available nutrients are derived from grass and grassland products, while the inclusion of arable crops and of certain miscellaneous by-products, such as brewers' grains, meat meal, and fish meal, brings the proportion of home-produced feeding-stuffs up to roughly 75 per cent of the total available supplies. The outstanding fact revealed in these figures is the predominant importance of grass as the main source of food for British live stock. If, therefore, any attempt is to be made to achieve a greater degree of self-sufficiency in regard to supplies of feeding-stuffs, it is natural to turn first to grassland production. It is well recognised that much of the existing permanent grassland (as well as of rough grazings) is capable of very great improvement; carefully controlled experiments have shown that the yield of dry matter per acre may be increased by 30 to 60 per cent by suitable manurial treatment, though for quick rejuvenation of old worn-out pastures the use of the plough may be necessary. The productivity of grassland may also be increased by the use of the right combination of grasses in re-seeding and by adopting a system of controlled grazing.

While improvement in the productivity of permanent grassland would add enormously to the quantity of home-produced nutrients available for stock feeding, the potential value of such improvement will only be fully realised if suitable methods are made available for conserving a large proportion of the herbage for winter feeding. In order to obtain a product of high nutritive value it is necessary for the herbage to be cut at an early (leafy) stage of growth, since at this stage the dry matter of the grass resembles in composition a relatively protein-rich concentrate. Haymaking is useless for this purpose, and this fact has led to the development of alternative methods of conservation, notably artificial drying and ensiling. The relative merits of these two methods are discussed in the text, and it is concluded that, while artificial drying is still in an experimental stage, ensiling could advantageously be adopted on a wide scale.

Reference is made to the reduction which has taken place in the acreage of arable land during the past sixty years, and to the influence of this on the supplies of home-grown feeding-stuffs. The turnover from arable to grassland has been accompanied by a corresponding increase in the importation of cheap cereals and protein-rich concentrates. At the present time imported cereals (chiefly maize) supply over twice the nutrients of home-produced cereals, while the imports of concentrates are also large. A return of at least part of our grassland to arable cultivation would be necessary if a determined effort were to be made to increase the proportion of home-produced feeding-stuffs. In particular, the acreage under oats would require to be substantially increased, an effort would need to be made to encourage the cultivation of beans, and the falling off in the acreage under roots might be off-set by an increase in the production of other winter forage crops such as cabbage and kale. It does not appear that any large-scale development in the cultivation of soya beans can be anticipated.

Finally, brief reference is made to the existing supplies of home-produced protein-rich by-products, and arguments are put forward for attempting to increase the output of animal by-products, and particularly of blood meal and fish meal.

In conclusion, it should be made clear that in the present article methods of increasing the supplies of home-grown feeding-stuffs have been considered without detailed reference to the economic factors involved. The object of the article has been to point out the potential ability of British agriculture to meet the increasing demand for feeding-stuffs. It is obvious, however, that economic considerations must also be taken into account. The development of the country's full potentialities in this direction will depend not only on world prices of imported feeding-stuffs, but on the measure of support which the agriculturist receives from the State. Such considerations raise problems which are outwith the scope of the present article.

ACKNOWLEDGMENTS.

The author's thanks are due to Dr R. E. Slade, to Colonel W. Ralph Peel, to Dr S. J. Watson of Imperial Chemical Industries, Ltd., and to Mr R. O. Davies of British Crop Driers, Ltd., for permission to reproduce certain plates and figures included in the text. He is also indebted to Sir Thomas Middleton, Sir John Russell, Dr J. F. Tocher, Dr H. E. Woodman, Dr W. L. Davies, Mr W. Robb, Mr R. G. M'Queen, Mr J. M. Ramsay of the Department of Agriculture for Scotland, and Mr W. J. Hewlett of the Ministry of Agriculture for the information which they have kindly supplied on various points. Finally, he desires to record his indebtedness to his colleagues on the staff of the Hannah Dairy Research Institute who have unreservedly placed their knowledge and experience at his disposal.

Note on Tables I. and II.

Table I.—With the exception of the nutrients derived from grazing, the composition of all classes of feeding-stuffs were taken from 'Rations for Live Stock' (Min. Agric. Bull. 48 (1936)). Total supplies were obtained as follows: home-produced cereals, rotation hay, roots and green crops, straw and hay from permanent grass, from 'Agricultural Statistics,' Part I., 1935; imported cereals and oil-seed products, from 'Agricultural Statistics,' Part II., 1935, and other official sources; and brewers' and distillers' grains, meat meal, blood meal, and fish meal by personal inquiries from the trade. Imports of oil-seeds have been converted to their equivalent cake value. Re-exports have not been allowed for, since they do not significantly affect the total supplies. The supplies of wheat offals were taken as 30 per cent of the total wheat milled, of which 756,000 tons were home produced and 4,858,000 tons were imported. ('Preliminary Report on the Census of Production, 1935.') In addition, 597,000 tons of wheat offals were imported as offals, while about 450,000 tons of unmilled wheat were fed to stock. Of the total supplies of barley, roughly half (*i.e.*, 800,000 tons) was used for feeding, this quantity being derived equally from the home produced and the imported product. The proportion of beans used for stock feeding was 85 per cent of the home production, and the proportion of peas 30 per cent of the home production. The average yield of dry matter from rotation grazing was taken as being roughly 20 per cent higher than the official yield of rotation hay—*i.e.*, 33 cwt. per acre. A similar allowance was made for grazing on the aftermath from rotation hay. The dry matter was assumed to contain 13·5 per cent protein equivalent and 65 per cent starch equivalent. The average yield of dry matter from permanent grazing was taken as 15 cwt. per acre. The yield of hay from permanent grassland is given officially as 22 cwt. per acre, which, with an allowance of 20 per cent for aftermath, would give a total yield per acre of 26 cwt. Only the best permanent grassland is, however, used for hay. In plot experiments unmanured permanent grassland seldom yields more than 20 cwt. per acre, while calculation from Middleton's data[1] gives a yield equivalent to between 10 and 12 cwt. per acre. The figure of 15 cwt. was therefore a compromise. The dry matter of the herbage was assumed to contain 10 per cent of protein equivalent and 60 per cent of starch equivalent. The amount of nutrients obtained from rough grazing was calculated from an estimate of the stock-carrying capacity of such land; the yield of dry matter worked out at 2 cwt. per acre and the composition at 1 per cent protein equivalent and 20 per cent starch equivalent.

TABLE II.—The requirements of all classes of stock were calculated from the standards laid down in 'Rations for Live Stock,' the total number and sub-division of stock into age groups being obtained from 'Agricultural Statistics,' Part I., 1935, and the yield of milk and eggs from the 'Agricultural Output of England and Wales,' 1930-31, and of 'Scotland,' 1930.

[1] 'Food Production in War.' Sir T. H. Middleton. Published by Oxford University Press (1923).

SOME FURTHER STOCK FEEDING TRIALS.

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I. INDOOR CROPS.—SUCCULENT FODDER IN TEN DAYS AND ITS VALUE IN BEEF PRODUCTION.

The growing of crops indoors and without any soil is, in some respects at least, still in the experimental stage; nevertheless the method of production has been sufficiently tested to demonstrate its very great potentialities and to show that it is a practical proposition.

A small shed covering about 15 square yards of ground can, in the winter period during which cattle are commonly housed and fed indoors, provide facilities for the daily production of succulent food amounting to as much as would normally be raised per annum on from two to three acres of well-farmed land—surely a striking example of *multum in parvo.*

The extent to which the output of this specially valuable cattle food is made possible by the adoption of the Sprout Process grips the imagination, and when one takes into account the phenomenal response made by fattening cattle in particular, to the inclusion of this food in their ration, one might well feel impelled to cry out " Eureka," " Eureka."

Several firms now provide equipment for the raising of indoor crops, but the Unit herein illustrated and described, and which was used in the production of the succulent fodder for the feeding trials briefly reviewed in this paper, was introduced and developed by Sprout Limited, the nutrient used being likewise that of Sprout Limited, and the procedure followed in keeping with their recommendations for the working of the plant.

The house used was a wooden erection with an apex roof to give greater height in the centre. The length of the building was 17 feet, the width 7 feet 9 inches, and the height to the eaves 7 feet 2 inches. The roof was covered with felt and the house was placed on a concrete foundation which also constituted the floor of the building.

There were two side doors in the centre of the building. These were exactly opposite each other, and, as there was a clear passage through, they were very convenient for entrance and exit.

On either side of each door there was a series of five windows, making a total of twenty windows in all. Each window was 6 feet long, 10½ inches wide, and hinged to open outward and downward to facilitate removal through the window of the trays containing the crop when it had reached the desired stage of growth.

There were galvanised iron shutters for fitting inside the windows to exclude light when the crop was in the early stage of growth, but after four or five days the shutters were removed and the light admitted, under the influence of which the crop soon assumed a luscious green.

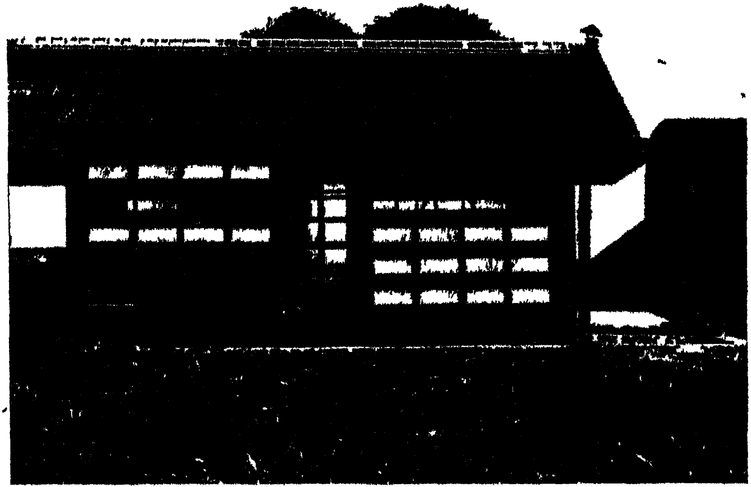


Photo by John Macfarlan.]

Fig. 11.—*The Sprout Unit showing door, windows, and heating chamber.*

Inside the house there were four series of five water trays, making twenty in all. Each water tray was 6 feet long, 3 feet 6 inches wide, and 2 inches deep, and was carried on 1½ inches angle iron supports welded to upright framing of like material. The angle iron supports were placed at 10½ inches centres, hence the total distance from tray to tray was 10½ inches. The crops, however, were generally fed just before reaching that height.

The top of the framing was rigid and braced to carry the main water-tanks, of which there were two—one at either side of the central passage—and each with a capacity of about 120 gallons.

For rapid germination and speedy growth of the crop, heat as well as abundant moisture was essential. The heat was obtained from a boiler placed outside at one end of the house and situated below the floor level. There were flow and return pipes from and to the boiler. These pipes ran round the sides of the house and were supported in concrete channels which permitted of them being placed just below the floor level.

The fuel used for the boiler was coke or anthracite, the amount consumed per week averaging about 2½ cwt. In very cold weather rather more was required to keep up the temperature than when milder conditions prevailed. To prevent excessive draught the boiler was housed in a small shed 6 feet long, 4 feet wide, and 3 feet 9 inches high, superimposed on top of the excavation in which the boiler was placed.

The seeds were germinated and the crops grown in shallow galvanised iron trays of which there were eighty in all. These trays were 3 feet 5 inches in length, 1 foot 5 inches in width, and 1 inch in depth, and had small projecting legs ⅝ths of an inch in length on which they rested. The bottoms of the trays consisted of perforated zinc with ⅛th inch perforations through which the roots passed when the seeds germinated.

Each of the main water trays was just of sufficient size to hold four of the small seed trays; the eighty seed trays accordingly fitted into the twenty main water trays, and as the crop was fed on the tenth day from the time the seed was placed in the tray, the daily output of succulent food was the produce of eight trays when the house was in full operation.

METHOD OF PROCEDURE.

On the assumption that maize is the crop to be grown—and from the trials we were able to carry out at Auchincruive it is a very suitable one, probably the most suitable one for the purpose—the first essential is the procuring of seed of high germinating capacity, otherwise the results are never so satisfactory. Very often the maize contains a proportion of old seeds which substantially lowers the percentage germination and necessitates the use of more seed in the trays to give a crop of the desired thickness.

With good fresh seed one would naturally expect the germination to be in the region of 90 per cent or even over that, but actual counts taken from time to time showed it to be on the average only about 70 per cent. Excellent though the results undoubtedly are from maize of 70 per cent germination, they would be still better from seed of higher germinating capacity, as the non-germinating seeds, especially any broken and damaged ones, tend to encourage the formation and growth of moulds, and thereby take away from the palatability of the crop.

It should perhaps be pointed out that the seeds which fail to germinate are not entirely lost as they would be under field conditions; they still have considerable feeding value, in all probability enhanced to some extent by the treatment to which they are subjected. They are accordingly fed with the succulent fodder and are for the most part readily consumed.

Having secured maize of the high standard desired, the next step is the soaking of the seed in warm water for a period of not less than twelve hours before it is deposited in the seed trays. The amount of seed required per tray in the Sprout Unit under consideration varied from 8 to 10 lb. in keeping with the germination of the sample, this being the weight of the dry seed prior to its being soaked in water.

After the seed has been soaked in water for at least twelve hours it is transferred to the seed trays and spread thereon at a uniform depth, thereafter the seed trays containing the maize are placed in the main water trays and left dry until the following day.

The next step in the process is the flooding of the trays with water from the overhead tanks. This is done to such an extent as to almost completely immerse the seeds in the seed trays. It is effected by turning the control tap by hand, but automatic control could no doubt be easily devised and put into operation.

THE NUTRIENT.

A feature of the SPROUT PROCESS is the special nutrient used, as it is claimed that this is a vital factor, not only in the speeding up of the growth of the crop, but also in the high nutritional value of the produce. It is an integral part of the process, and in all the trials carried out by the College the special nutrient—which is a very complex one containing no fewer than sixteen different chemical constituents—was used in the production of the crops.

The nutrient is first dissolved in a little water and is then added to the water in the tank at the rate of one gramme of nutrient to one gallon of water—a total of 120 grammes for the 120 gallon tank. This is done daily just immediately prior to turning on the supply of water; the water conveyed from the overhead tanks to the main water trays accordingly supplies the nutrient to the growing crop.

When the moisture requirements have been met the overhead tanks are again filled up from the supply pipes, but the prescribed amount of nutrient is not added until just prior to flooding on the following day. The filling of these overhead tanks is done twenty-four hours before the water is used, in order that the temperature of the water may be raised to the house temperature before it is passed on to the crop. This procedure avoids the chilling of the roots which would result if cold water were used.

THE TEMPERATURE DESIRED.

If the best results are to be obtained it is essential that the internal temperature of the Sprout Unit be maintained as near as possible to the optimum growth temperature for the particular crop. In the case of maize the minimum temperature should never be below 70° F. nor the maximum quite up to 90° F. A temperature somewhere between 75° F. and 85° F. gives very good results.

In the case of oats and barley, which were only tested on a small scale, the optimum temperature for growth is lower, the range of temperatures being between 60° F. and 70° F. In view thereof maize and oats cannot both be successfully grown at the same time in one Sprout Unit, though fair results from both crops might be obtained at a temperature of 70° F.

On the third day, and daily thereafter, the water is drained off from the water trays, and after an 'airing' period, which may extend to as much as two hours if the humidity of the atmosphere in the Sprout house is sufficiently high, fresh water from the overhead tanks, and to which the nutrient has just been added, is run into the water trays.

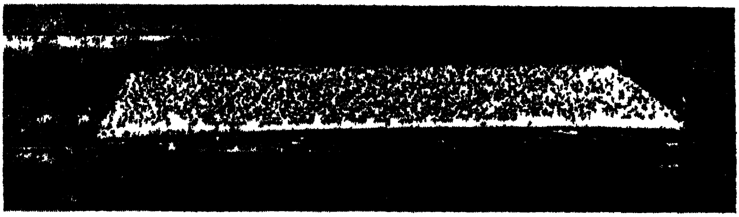
The water level should now be a little lower than at the first flooding and should be just above the perforated gauze, which constitutes the bottom of the seed trays, until such time as the roots have developed sufficiently to penetrate the gauze and reach the water below. Thereafter, the level of the water should be maintained not quite up to, but just a little below, the perforated gauze, as this seems to bring about the best root development and the most rapid growth.

The giving of the right amount of water daily at the different stages of growth is a vital factor in the raising of good crops. In the early stages of growth an ample supply is necessary to secure satisfactory germination and good root development, and if during subsequent growth the amount given at any time is insufficient, the roots will appear somewhat withered and brown, and the growth will not be so good.

Excess of water, on the other hand, is equally bad as it excludes air and causes 'drowning' of the seed, this being commonly followed by poor germination and mould growth which adversely affects the bulk and the palatability of the produce.

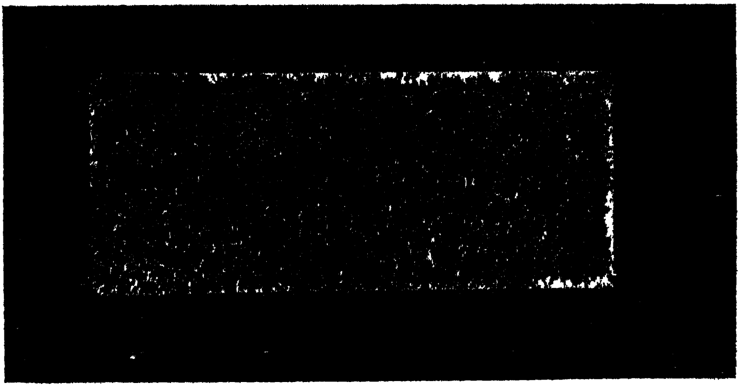
On the tenth day the crop should be at the right stage for feeding, and as eight seed trays will have been filled each day

Fig. 12.—*Galvanised iron trays removed from the water trays in the Sprout Unit.*



Tray filled with maize that has been soaked in water.

The crop on the ninth day.



Photos by John Macfarlan.]

The penetration of the roots through the gauze.

over the ten-day period the produce of eight trays will be available in sequence daily thereafter for feeding to stock. There is no waste in Sprout feeding as every part, leaf, stem, seed and root, is fed.

THE NEED FOR SCRUPULOUS CLEANLINESS.

Another factor of importance in the successful running of the Sprout Unit is scrupulous cleanliness, and when the crop is removed from the seed trays these and the main water trays should be thoroughly washed and scrubbed before being again filled up. This precaution is *absolutely essential* in the control of mould, which is one of the few difficulties that the grower has to contend with. The need for cleanliness cannot be over-emphasised, so vital is it to successful crop production.

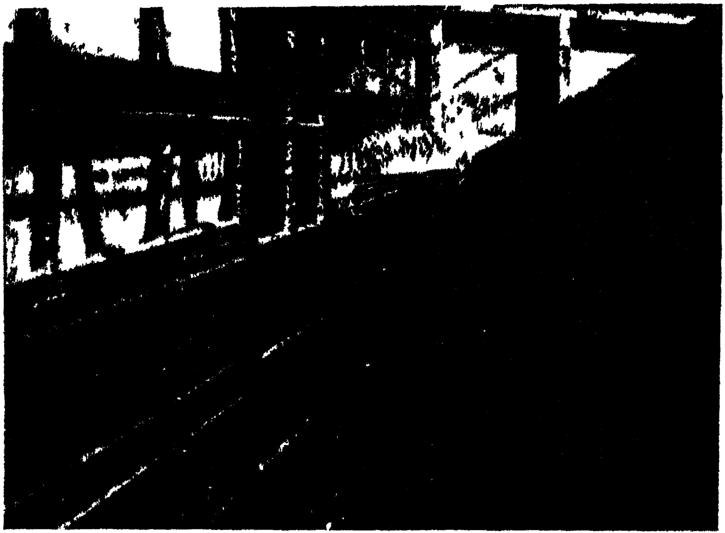


Photo by John Macfarlan.]

Fig. 13.—*One side of the Sprout Unit showing:* Left, *galvanised iron shutters in position;* Right, *one window opened for the removal of a tray of Sprout.*

THE INFLUENCE OF LIGHT ON GROWTH.

With regard to the influence of light on growth it should be noted that, while the Sprout house had ten windows on either side, galvanised iron shutters were also provided for the exclusion of light when desired. These shutters fit on to the inside of the windows, and, apart from excluding the light, they are of assistance in the maintaining of a more even temperature.

It is very doubtful if light should be admitted at any stage of growth; for the first five days it should undoubtedly be excluded, as it is definitely detrimental to germination and growth in the early stages. Its admission in the later stages brings about a marked change in colour in that it gives rise to fine green as against yellowish tinged produce. In this connection, though comparatively little work has so far been carried out to test the difference in feeding value, nevertheless crops grown with practically no light, as against those grown with light freely admitted, did not appear to show any difference in actual feeding value, nor did there appear to be any difference in the palatability of the produce. The main difference was in the colour of the produce, that grown without light being yellowish and that with light a beautiful green.

WEIGHT OF CROP.

It was indicated that from 8 to 10 lb. of maize was put into each seed tray at the start of the process. The crop removed on the tenth day should be at least three and a half times the original weight of seed used—*i.e.*, from 28 to 35 lb.—and a yield of fourfold, 32 to 40 lb. is not impossible of attainment. With regard to yield the fact should not be overlooked that material change has taken place, dry maize seed has been changed into a highly nutritious succulent fodder in the form of living green or yellowish produce which is much relished by stock, and, when included in the ration in even relatively small amounts, materially influences rate of progress.

RESULTS FROM FEEDING TRIALS.

Coming now to consider the actual results from the inclusion of this succulent food in winter rations for stock, readers are reminded of two preliminary trials carried out by the College at Auchincruive in the winter of 1935-1936, and reported on in the 'Transactions' for 1936.

The striking results obtained in these preliminary tests fully justified the carrying out of further trials with greater numbers of cattle, and in the last two winters, 1936-1937 and 1937-1938, four additional investigations have been undertaken. Six feeding trials in which SPROUT was fed to fattening cattle have accordingly been carried out by the College.

The cattle utilised in these trials now number 168. Of these, 70 were fed SPROUT as part of their ration, the other 98 cattle being used mainly as controls and for testing for comparison rations containing Dried Grass, in order that first-hand information as to the value of this foodstuff, which has been so much in the limelight in recent years, might be available.

Fig 14.

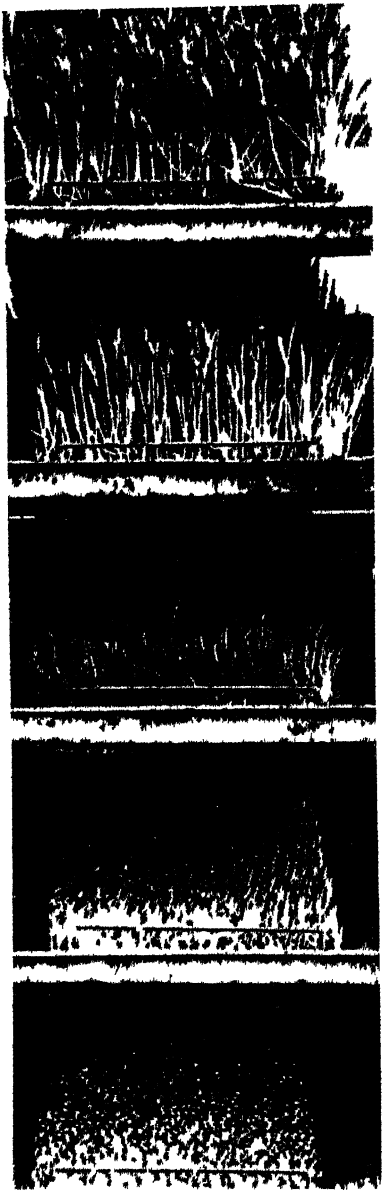


Photo by John Macfarlan]

Trays removed from the Sprout Unit to show the progress from the first to the ninth day by two day intervals The top tray shows the crop on the ninth day

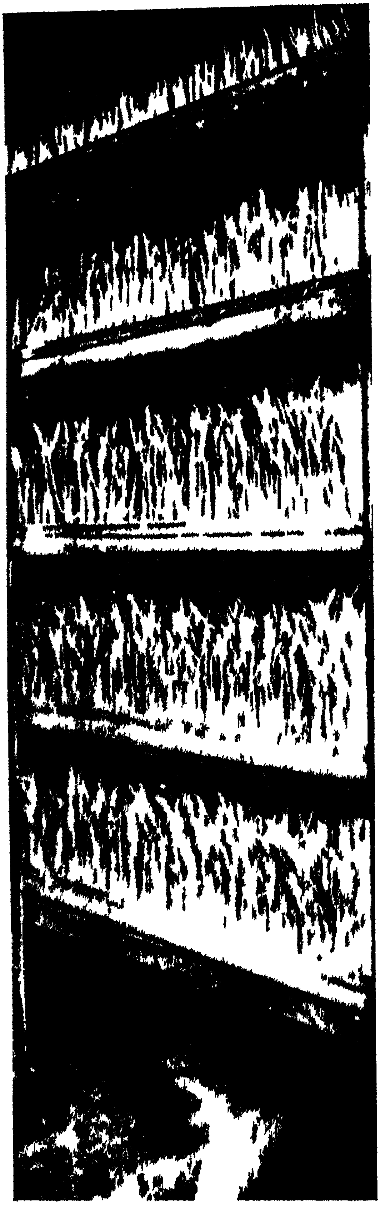


Photo by John Macfarlan]

Trays in position in the Sprout Unit and showing the rapid daily progress from the fifth to the ninth day The bottom tray shows the crop on the ninth day

The investigations, being on a larger scale than the preliminary ones, necessitated the provision of facilities for a greater daily output of SPROUT than was possible from the small Unit first used, and the Sprout house already described and illustrated was obtained, being kindly supplied by the firm of Sprout Limited.

At first the new Unit did not prove very satisfactory, in that it was extremely difficult, in fact almost impossible, to maintain the high temperature required to get the best growth from maize, with the result that the crops were poor and the daily output rather disappointing. After some slight additions to the building had been effected, however, very satisfactory growths resulted.

Profiting by experience the minor defects which proved troublesome were completely eliminated in all Sprout Units subsequently issued. Unfortunately, however, the fact that the house was not entirely satisfactory at first affected somewhat adversely the response by the cattle in the feeding trial then in progress. Nevertheless, though the response to the inclusion of SPROUT was not quite in keeping with what previous trials had led us to expect, it was still considerably in advance of that from the control or standard ration.

SPROUT A SUBSTITUTE FOR ROOTS.

In the trials SPROUT was neither looked on nor used as a concentrate but as a succulent food, and, as roots, turnips, swedes and mangels are widely used in beef production and are costly to produce, one of the main objects in view was to ascertain if the inclusion of SPROUT in the ration for fattening cattle would make it possible to cut down the allowance of roots, and subsequently the extent of the root break, without any reduction in the number of cattle fattened.

The following shows the analyses of typical samples of swedes and of the SPROUT used in the feeding investigations :—

	Swedes.	SPROUT.
Moisture	89·98%	77·64%
Dry Matter	10·02%	22·36%
Oil	0·06%	1·02%
Albuminoids	0·80%	3·05%
Fibre	0·88%	1·10%
Ash	0·57%	0·52%
Soluble Carbohydrates by difference .	7·71%	16·67%

SCHEME OF EXPERIMENTS.

In devising the experiments to be undertaken it was decided to replace swedes with SPROUT on an equivalent Dry Matter basis as, despite the variation in the albuminoid, oil, fibre, carbohydrate and ash content of such feeding-stuffs as swedes, mangels, potatoes, carrots and kale, feeding trials with fattening cattle and dairy cows alike had shown the Dry Matter content of these crops to be a fairly reliable indication, indeed probably the best indication, of their relative feeding values.

The Dry Matter content of the swedes on the analyses just given was 10·02 per cent, and that of the SPROUT 22·36 per cent, and, as a shot in the dark, it was decided to replace, on an equivalent Dry Matter basis, 20 lb. swedes with SPROUT. On the basis of the analyses 20 lb. swedes contained 2·00 lb. Dry Matter, hence as SPROUT contained 22·36 per cent Dry Matter, 9 lb. of SPROUT were required to replace 20 lb. of swedes.

Throughout the entire period of the feeding trials swedes and SPROUT were regularly examined for Dry Matter content and the amount of SPROUT adjusted to supply a corresponding amount of Dry Matter to that contained in the swedes which it replaced.

The replacing of 20 lb. swedes with the equivalent in SPROUT, though referred to as a shot in the dark, was nevertheless a fairly successful one in that the response to the ration containing that amount of SPROUT was always definitely better than the response to the standard ration.

Having in the first place conclusively demonstrated the benefit from the inclusion in the ration of SPROUT equivalent in Dry Matter content to 20 lb. swedes, the next line of investigation was to ascertain the effects from feeding larger and smaller amounts of SPROUT with the swede ration adjusted in keeping with these amounts. Could, for example, as much as 30 lb. swedes, actually half the average daily root allowance of 60 lb., be replaced with 13½ lb. SPROUT which would supply an equivalent amount of Dry Matter to that in 30 lb. swedes? The possibility of such a drastic cut in the root allowance would appeal strongly to many farmers who are cattle feeders, but who find the root crop a costly and precarious one to grow.

Then again information as to the effect of replacing only 10 lb. swedes with SPROUT equivalent thereto—namely, 4½ lb.—also seemed called for in order to ascertain if the smaller amount of SPROUT would prove sufficient to give the same stimulus to the process of Animal Metabolism as would seem to result when a larger amount of SPROUT is fed. The results from the feeding of SPROUT in the amounts referred to and the relative economy of root and SPROUT rations were some of the points on which information was desired.

THE CATTLE USED IN THE FEEDING TRIALS.

The cattle utilised in the feeding trials carried out in the last three winters were purchased at Lockerbie at the Sales held early in October of each year. The actual numbers bought were as follows :—

	Numbers Purchased.
October 1935 . . .	58
„ 1936 . . .	61
„ 1937 . . .	59
	Total 178

All of the cattle purchased were bullocks, the great majority being Shorthorn Galloway crosses (Blue-greys), but there were also a number of pure Galloways and a few Shorthorn Angus crosses.

The feeding experiments were continued for periods of either twelve or fourteen weeks, by which time the cattle were well finished. They were all sold on the dead-weight basis, so that carcass weights might be obtained and any differences in the appearance of the meat of different groups noted.

The building in which the feeding trials were carried out was in every way suitable for the purpose, and has already been dealt with in an article which appeared in 'Transactions' in 1933, and need not be further referred to here except to say that it provides accommodation for twenty-eight cattle at a time. In view thereof the procedure adopted each year has been to house the heavier and more forward bullocks just after they were purchased in early October and to run the others outside until January, when, the first lot having been disposed of and the boxes cleaned out, the second lot can then be dealt with.

SWEDES *versus* SPROUT.

Reviewing first the feeding trials in which 20 lb. of swedes (one-third of the root ration normally fed) were replaced with SPROUT supplying an equivalent amount of Dry Matter, the particulars are as follows:—

Experiment A.

This feeding trial was carried out during the period October 1935 to January 1936, and though it has already been reviewed in the 'Transactions' for 1936, for the sake of convenience and comparison the results from the control and SPROUT rations are again summarised here.

The control ration consisted of a daily average over the twelve weeks feeding period of—

10 lb. hay;
6 lb. straw;
7¼ lb. concentrates;
60 lb. swedes.

This ration, with a slight variation in the quantity of concentrates in keeping with the initial live weight of the cattle, constituted the control in all of the experiments carried out.

In the case of the ration containing SPROUT the swedes were cut down to an average over the feeding period of 40 lb. daily, and SPROUT supplying equivalent Dry Matter to that in 20 lb. swedes was included. The rations otherwise were identical.

The concentrate mixture consisted of—

4 parts crushed oats;
4 parts flaked maize;
2 parts decorticated ground nut cake;
1 part linseed cake.

The starting allowance was 6 lb. daily, with a fortnightly increment of ½ lb., which brought the allowance to 8½ lb. in the eleventh and twelfth weeks, and thus gave an average of 7¼ lb. over the entire feeding period.

The swede allowance for the control group commenced at 54 lb. daily. This was increased to 60 lb. at the beginning of the fifth week and to 66 lb. at the ninth week, thus averaging 60 lb. daily over the feeding period.

In the case of the SPROUT group the commencing allowance of swedes was 36 lb., increased to 40 lb. in the beginning of the fifth week and to 44 lb. in the ninth week, an average over the feeding period of 40 lb. daily. SPROUT was included to the extent required to bring the Dry Matter content up to the equivalent of that of the control ration. With swedes containing 10 per cent of Dry Matter and SPROUT 22 per cent, the amount of SPROUT required was just a little over 9 lb.

The reason for increasing the ration in the manner indicated was to meet increasing requirements as the animals put on weight, as that is necessary if steady progress is to be maintained over the fattening period.

The results from this preliminary trial with SPROUT were as follows :—

Group.	No. in Group.	Average Live Weight.		Average Live-weight Increase.	
		Start.	Finish.	For Period of 12 Weeks.	Per Week.
		lb.	lb.	lb.	lb.
Control	12	971	1188	217	18·0
SPROUT	4	966	1228½	262½	21·8

In this preliminary trial the replacing of 20 lb. swedes with SPROUT supplying an equivalent amount of Dry Matter actually accelerated the average rate of increase by 3·8 lb. per week, or fully ½ lb. daily over the entire feeding period, as compared with the control group. The SPROUT was accordingly not only equal in feeding value to the swedes which it replaced, but actually very materially superior thereto.

Experiment B.

The second trial was on similar lines to the one just referred to, and was commenced as soon after the completion of the first trial as was necessary to get the dung removed from the feeding boxes and the entire building thoroughly washed out. It extended from January to April 1936, and as the cattle used in this trial had been outwintered until required for the experiment and were a little backward in condition, this experiment was continued for fourteen weeks instead of the usual twelve-week period. Further, as their initial weight was not quite up to that of the cattle in the first trial, the allowance of concentrates was reduced by ½ lb. It commenced at 5½ lb. daily and advanced by fortnightly increases to 8½ lb. in the thirteenth and fourteenth weeks, thus averaging 7 lb. daily over the entire feeding period. Otherwise, the rations were identical.

The particulars relative to this trial are as follows :—

Group.	No. in Group.	Average Live Weight.		Average Live-weight Increase.	
		Start.	Finish.	For Period of 14 Weeks.	Per Week.
		lb.	lb.	lb.	lb.
Control	12	869	1102	233	16·6
SPROUT	4	746	1036	290	20·7

It will be noted that in the above trial the response to the inclusion of SPROUT was even better than in *Experiment A.*, the average live-weight increase being accelerated by fully 4 lb. per week as compared with the progress made by the cattle on the control ration, and the average over the feeding period amounting to almost 21 lb. or 3 lb. daily.

It should, perhaps, be pointed out that the SPROUT group of cattle had in one respect a slight advantage in this trial as they were fully 1 cwt. lighter than the bullocks in the control group at the commencement of the feeding period. Despite this initial difference in live weight the results from the inclusion of SPROUT equivalent in Dry Matter content to 20 lb. swedes which it replaced are very suggestive.

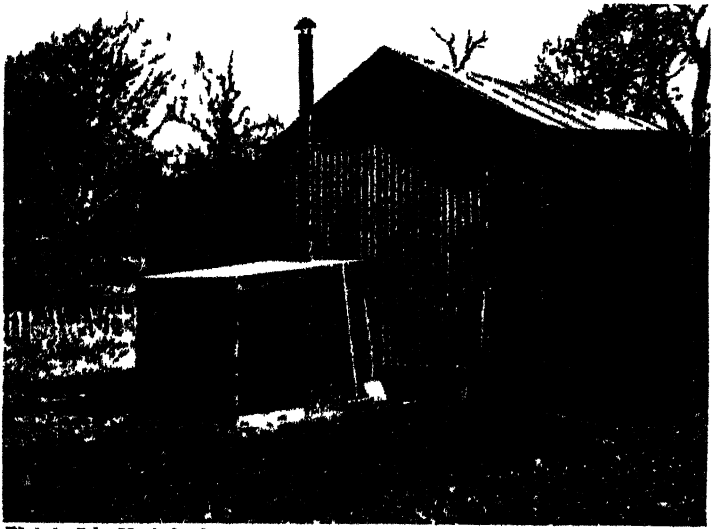


Photo by John Macfarlan]

Fig. 15.—*The Sprout Unit with enclosed heating chamber and protecting porch.*

Experiment C.

Before commencing this trial the house fully described and illustrated in the earlier stages of this article was procured in order that larger scale trials might be carried out. Unfortunately, as has already been indicated, the new Sprout Unit was at first somewhat disappointing in certain respects. Owing to defects in construction loss of heat resulted, and it was difficult to maintain the desired temperature. The trouble was aggravated to some extent by the fact that the house was situated in a much more exposed position than the old Unit, and by the cold winds and frosts experienced at that time. In view thereof the temperature of the house frequently fell below the optimum for maize, with the result that the crops which had to be fed on the tenth day were often disappointing and far short of SPROUT at its best.

The minor defects in the new Sprout Unit were gradually searched out and dealt with, being finally overcome by the erection of protecting enclosures which proved a great success. Before the end of the trial the house could be maintained at the desired temperature and excellent crops produced.

In this trial there were three groups of cattle. Two of the groups were fed as in the two previous experiments, one group being fed the control ration and the other SPROUT equivalent to 20 lb. of swedes. The third group had the swede allowance reduced to an average of 30 lb. daily, half of that of the control ration, and SPROUT equivalent to 30 lb. swedes included. On the basis of 10 per cent Dry Matter in swedes and 22 per cent in SPROUT, 13½ lb. SPROUT were required to replace 30 lb. swedes.

This trial was carried out from October 1936 to January 1937, and was continued for a period of twelve weeks. With the larger daily output of SPROUT made possible by the provision of the new Sprout Unit, larger numbers of cattle could now be fed thereon. The results of the trial were as follows :—

GROUP.	No. in Group.	Average Live Weight.		Average Live-weight Increase.	
		Start.	Finish.	For Period of 12 Weeks.	Per Week.
		lb.	lb.	lb.	lb.
Control . .	10	973	1160½	187½	15·6
SPROUT (equiv. to 20 lb. swedes). .	10	973	1180	207	17·2
SPROUT (equiv. to 30 lb. swedes). .	8	976½	1179	202½	16·8

In this feeding trial the results from replacing part of the swede ration with SPROUT supplying an equivalent amount of Dry Matter are not so good as in *Experiments A.* and *B.*, the chief reason being the unsatisfactory crops produced in the new Sprout Unit prior to minor alterations and additions being effected. At the same time, it should be observed that progress has nevertheless been slightly increased by the inclusion of SPROUT, and that even where the root allowance was reduced to 30 lb. daily the live-weight increase was still rather greater than in the case of the control group.

It will also be observed that there was little difference in the result from SPROUT equivalent to 20 lb. and SPROUT equivalent to 30 lb. swedes, and, whatever the reason may be for the beneficial effect from SPROUT, it would appear that the smaller amount fed in *Experiments A.* and *B.* and to Group II. in *Experiment C.* is ample to bring about the desired result.

On the other hand, the result would seem to indicate that by the inclusion of SPROUT equivalent to 30 lb. swedes the daily allowance of swedes can be reduced from 60 lb. to 30 lb. without progress being adversely affected. This suggests the possibility of effecting material reduction in the root break and substituting therefor a Sprout Unit for the raising of indoor crops.

Experiment D.

This trial was continued for a period of fourteen weeks, and carried out from January to April 1937, the cattle as in *Experiment B.* having been outwintered until the commencement of the trial. In view of the rather less pleasing results from SPROUT in the previous trial this succulent fodder was again included.

The control ration was the same as that used in previous tests, but as many stock feeders desired information as to the value of 'Dried Grass,' this food was also included in the trial to ascertain if it could be used to replace concentrates, and if its inclusion brought about a response in any way similar to that from SPROUT. Its use in a previous trial in which it had replaced half the concentrates had given a very promising result.

The analysis of the Dried Grass used in this trial showed its composition to be as follows :—

Moisture	12·90	per cent.
Albuminoids	11·23	„
Oil	2·96	„
Fibre	20·28	„
Ash	8·09	„
Soluble Carbohydrates by difference	44·54	„

The complete scheme of rationing was arranged on the following lines :—

GROUP I. Control Ration.
„ II. SPROUT replacing one-third of the swede allowance in the control ration.
„ III. Dried Grass replacing concentrates in the control ration on an equal weight basis.
„ IV. SPROUT replacing one-third of the swede allowance in the Dried Grass ration.

It will be observed that the experiment was devised so as to ascertain the effect of replacing one-third of the swedes with SPROUT, both in the control and Dried Grass rations. The results were as follows :—

GROUP.	No in Group.	Average Live Weight.		Average Live-weight Increase.	
		Start.	Finish.	For Period of 14 Weeks.	Per Week
		lb.	lb.	lb.	lb.
Control . . .	8	887	1097	210	15
SPROUT . . .	4	875	1151½	276½	19·7
Dried Grass . .	8	887	1071	184	13·1
Dried Grass with SPROUT . .	8	887	1115	228	16·3

In the above trial SPROUT has once again demonstrated the very marked influence it has on progress, the results being in keeping with those of *Experiments A.* and *B.*

Compared with the control ration SPROUT accelerated the rate of increase by 4·7 lb. per week, which represented a total of 66½ lb. more than the control group in the fourteen-week feeding period.

The beneficial effect from its inclusion in the Dried Grass ration was not quite so pronounced as with the Control Ration, but even there progress was accelerated by 3·2 lb. per week, which would seem to indicate that SPROUT fulfils some function in connection with Animal Nutrition that is not fulfilled to the same extent by Dried Grass, or that it supplies something of importance in nutrition which Dried Grass fails to contribute to the same extent.

The progress made by the cattle on the Dried Grass ration, though scarcely equal to that of those on the control ration, nevertheless indicates the possibility of using Dried Grass as a concentrate and lessening dependence on imported purchased feeding-stuffs.

Experiment E.

In this feeding trial, which was carried out from October 1937 to January 1938 and covered a period of twelve weeks, SPROUT and Dried Grass were under further test.

Two different grades of Dried Grass—a high grade and a medium grade—were included, hence the scheme differed somewhat from the previous trial. The analyses of the two types of Dried Grass used in this trial gave the following results :—

	High Grade.	Medium Grade.
Moisture	12·20	11·53
Albuminoids	16·28	11·34
Oil	2·85	2·59
Fibre	17·61	19·01
Ash	9·67	9·83
Soluble Carbohydrates by difference	41·39	45·70

It will be observed that the medium grade of Dried Grass was very similar to that fed in Experiment D.

The full scheme of rationing comprised the following Groups and rations :—

GROUP I. Control ration.
,, II. SPROUT equivalent to one-third of swede allowance in the control ration.
,, III. Concentrates replaced with an equal weight of High-Grade Dried Grass.
,, IV. Concentrates replaced with an equal weight of Medium-Grade Dried Grass.
,, V. Concentrates replaced with Medium-Grade Dried Grass and one-third of the swede allowance replaced with SPROUT.

The results of the trial were as follows :—

GROUP.	No in Group.	Average Live Weight.		Average Live-weight Increase.	
		Start.	Finish.	For Period of 12 Weeks	Per Week
		lb.	lb	lb.	lb.
Control	6	1020	1195	175	14·58
SPROUT	6	1020	1237	217	18·08
Dried Grass (High Grade)	6	1027	1211	184	15·36
Dried Grass (Medium Grade)	6	1027	1197	170	14·19
Dried Grass (Medium Grade) with SPROUT	4	998	1208	210	17·5

The SPROUT, once again, had a very marked effect, raising the weekly live-weight increase by 3½ lb. as compared with the control, and by 3⅓ lb. as compared with the Dried Grass ration without SPROUT, thereby confirming previous results and indicating that even a ration which includes Dried Grass is made much more effective by the inclusion of a small amount of SPROUT.

Experiment F.

This trial, which was designed to extend from January to April 1938, has just concluded.

The benefit from the inclusion of SPROUT having been put beyond all doubt, the main object now in view was to ascertain the best amount of SPROUT to include in the ration. In the only trial in which the amount had been varied the inclusion of SPROUT equivalent to 30 lb. swedes had scarcely given as good a result as SPROUT equivalent to 20 lb. swedes. No trials with SPROUT equivalent to less than 20 lb. swedes had been carried out by the College, but after due consideration it was decided that the amounts included should be the equivalent in terms of Dry Matter content of 10, 20, and 30 lb. of swedes respectively.

There were four groups of cattle, the full scheme of feeding being as follows :—

GROUP I. Control ration.
,, II. SPROUT replacing 10 lb. swedes.
,, III. SPROUT replacing 20 lb. swedes.
,, IV. SPROUT replacing 30 lb. swedes.

The particulars regarding the progress made by the four groups of cattle are as follows :—

GROUP.	No. in Group.	Average Live Weight at		Average Live-weight Increase.	
		Start.	Finish.	For period of 12 Weeks.	Per Week.
		lb.	lb.	lb.	lb.
Control . . .	6	917	1106	189	15·75
SPROUT equivalent to 10 lb. swedes .	8	905	1141	236	19·66
SPROUT equivalent to 20 lb. swedes .	6	917	1150	233	19·42
SPROUT equivalent to 30 lb. swedes .	8	905	1123½	218½	18·21

It will readily be apparent that the replacing of swedes with SPROUT, whether equivalent to 10, 20, or 30 lb. swedes, has had a very marked influence on progress. In that connection it would seem as if SPROUT equivalent to even 10 lb. swedes was all that was required to give the desired stimulus to Animal Metabolism, and though a still smaller amount has, so far, not been used in these trials, it is quite conceivable that it might prove equally effective.

EFFECT OF SPROUT ON QUALITY OF BEEF.

Apart from the influence of SPROUT in accelerating very materially the rate of live-weight increase, a result which has now been conclusively demonstrated, there is another very important benefit from its inclusion—namely, the effect on the quality of the beef. It produces meat of excellent appearance, singularly tender, and attractive to the palate. During the last four years many tests have been made with 'SPROUT fed' and 'no SPROUT' beef, and without exception the superiority of the former has always been very pronounced. The actual monetary value of this improvement in quality of beef cannot be readily assessed, but it is nevertheless a matter of very great importance, and when the influence of SPROUT in the production of superlative quality of meat is better appreciated an enhanced price for SPROUT-fed cattle will be likely to follow.

One very noticeable feature of SPROUT-fed cattle is the material improvement in bloom that follows its inclusion in a winter ration, this being generally quite apparent in a period of three or four weeks. SPROUT-fed cattle always impress as being sappier, and in that respect are more like grass-fattened animals. When the cattle are slaughtered the killers unanimously affirm that they can tell those that have had SPROUT even by the ease with which the skins can be stripped off.

As regards relative carcass weights of the cattle fed on the control ration and those on SPROUT, there is no significant difference, the carcass weight to unfasted live weight for all control groups being 55·5 per cent, and for the SPROUT-fed cattle 56 per cent. In view of the acceleration in progress from SPROUT one might reasonably expect a higher percentage of carcass weight also, but probably the sappier condition already referred to nullifies this to some extent.

INFLUENCE OF SPROUT ON DIGESTION.

In looking for an explanation for the marked response to SPROUT, the possibility of it having a beneficial effect on digestion and of the animals getting greater good from the ration as a whole, suggests itself as a feasible explanation.

To test this theory a digestion trial was actually carried out, two bullocks being utilised for that purpose. There were two periods of fourteen days each, the fæces being collected for the last five days of each period.

During the first fourteen-day period the bullocks were fed a ration very similar to the standard ration used in the other trials, excepting that mangels were used in place of swedes.

During the second fourteen-day period SPROUT replaced part of the root ration on an equivalent Dry Matter basis.

When SPROUT was included there was some improvement in the digestibility of all the nutrients in the ration, with the single exception of the fibre; the greatest improvement was in the digestibility of the true protein, the digestion coefficient for same in the case of the control ration being 53·4 per cent, and in the SPROUT ration 59·1 per cent. Suggestive though the difference in digestion undoubtedly is, it can in itself scarcely account for the marked difference in live-weight increase that follows the inclusion of SPROUT in a ration. There are numerous other feasible explanations, such as the influence of the nutrient, of hormones, vitamins, &c., and further investigation is called for.

IS THE FEEDING OF SPROUT AN ECONOMIC PROPOSITION?

In this connection several factors call for consideration before the benefits from the inclusion of SPROUT in the ration can be adequately assessed:—

(*a*) The phenomenal progress made by the SPROUT-fed cattle and the monetary value of the additional live-weight increase.

If we exclude Experiment C., in which the SPROUT, on account of minor faults in the Sprout Unit, was not up to the usual standard, and compare, in the other five experiments, the results from the control ration with those from the ration in which one-third of the swedes were replaced with SPROUT, the average weekly live-weight increase for the 68 cattle in these two groups works out as follows:—

Control ration, average live-weight increase 16·3 lb. per week.

One-third of swedes replaced with SPROUT, average live-weight increase 20 lb. per week.

The greater live-weight increase due to the inclusion of SPROUT equivalent to 20 lb. of swedes is accordingly 3·7 lb. per week, or 44½ lb. in the 12-week feeding period.

With beef, inclusive of 'quality subsidy,' at 52s. per cwt. (44s. 6d. per cwt. plus subsidy of 7s. 6d.) this additional live-weight increase, due to the inclusion of SPROUT, has a value of 20s. The average amount of SPROUT fed per bullock was 9 lb. per day, and in the 12-week feeding period this amounted to 6¾ cwts., hence the value per ton of SPROUT in terms of enhanced live-weight increase at 52s. per cwt. is 59s. 2d., or approximately £3 per ton of SPROUT fed, based on live-weight increase alone.

(*b*) The value of the swedes which SPROUT replaced.

This is another factor that requires to be taken into account. The total quantity of swedes fed per bullock in the case of the control ration, with an average of 60 lb. daily, was 45 cwt. for the 12-week feeding period, and in the SPROUT ration, in which SPROUT replaced one-third of the swedes, the amount was 30 cwt. A saving of 15 cwt. of swedes was accordingly effected by the inclusion of SPROUT. If we take 15s. per ton as the value of the swedes this would be equivalent to 11s. 3d. for 15 cwt., but as only 6¾ cwt. of SPROUT were required to replace 15 cwt. of swedes, the swede replacement value of SPROUT on the equivalent dry matter basis is accordingly 33s. 4d. per ton. If the value assigned to the swedes was 20s. per ton, and in many districts they cannot be produced for less, the swede replacement value of SPROUT would then be raised to 44s. 5d. per ton.

The saving from the reduction in swedes fed and the value of the greater live-weight increase that results from the inclusion of SPROUT have a monetary value considerably greater than the cost at which SPROUT can be produced.

(*c*) The very material saving in the cost of beef production from the shortening of the fattening period.

This is another very important result from the inclusion of SPROUT in the ration, as it substantially reduces the period of time required to fatten an animal.

A traveller will complete his journey more quickly if his average speed is 20 miles per hour than if it is only a little over 16 miles per hour, and in the same way the SPROUT-fed cattle progressing at the average rate of 20 lb. per week will be ready for the market much earlier than the cattle whose progress is just slightly over 16 lb. per week. This shortening of the feeding period is one of the greatest benefits from the inclusion of SPROUT, as it generally effects a saving of as much as three weeks' feeding per animal fattened, and that alone represents a reduction in feeding costs of £1 per bullock.

Working as we have been on a comparatively small scale, and gradually acquiring experience of the methods that secure the greatest output, it is not yet possible to give in detail the actual cost of production per ton of SPROUT; nevertheless, in the light of our experience and with all relevant charges included, such as interest on capital, depreciation, labour, nutrient, coal, &c., this should not exceed £4 per ton.

The value of the additional live-weight increase produced and the saving in the root ration have in themselves a value in excess of that sum, whilst the shortening of the feeding period effects a further substantial saving per bullock fattened.

The inclusion of Sprout *to replace part of the root ration is accordingly, in the opinion of the writer, a sound economic proposition.*

The experiments reviewed have mostly been trials designed to ascertain the value of Sprout in beef production, but as a component in the winter ration for dairy cattle in calf or in milk it is also very valuable. Fed during the dry period it fits the cow to stand the strain of the next lactation, and the ultimate effect of its inclusion is a substantial increase in the yield of milk. There was no opportunity for testing its influence on fertility, but in view of its Vitamin E content beneficial results are likely to follow its use.

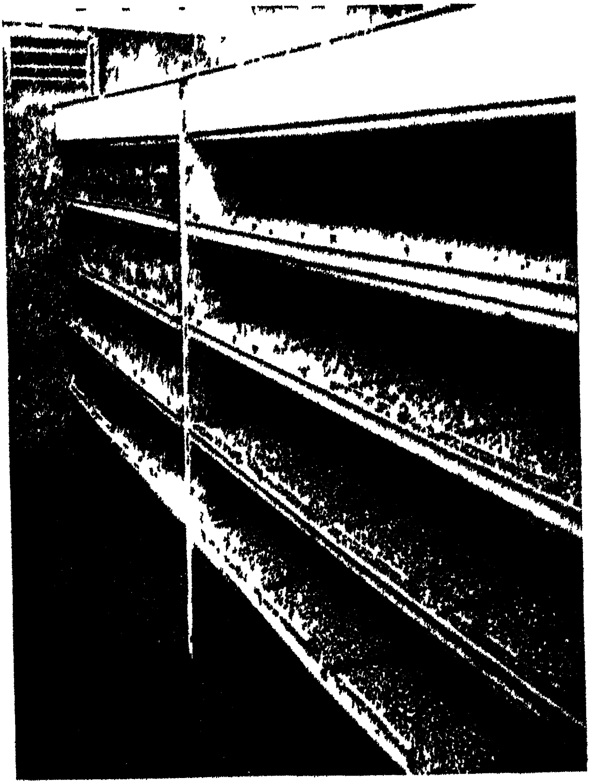


Fig. 16.—*Shows the new Sprout Unit designed to produce crops for feeding on the eighth day.*

Its general influence on bloom and on the health of the stock is also readily apparent, but is difficult to assess in

£. s. d. In that connection there is good reason for believing that the inclusion of Sprout, even in small amounts, in the ration for dairy cows during the spring period whilst they are still indoors and when the seasonal death-rate amongst young calves is abnormally high, would prove an important factor in materially reducing the losses that occur at that period of the year.

The increase in output made possible by the adoption of the Sprout process is another factor of considerable importance in this country, in view of the imports of beef which amount to the equivalent of approximately two million cattle per annum. An increase in the home output would help to lessen dependence on supplies from overseas.

A New Sprout Unit.

The illustration on the previous page shows a new and improved small Sprout Unit rather different in some respects from the one already described. It is designed to produce crops for feeding on the 8th as against the 10th day, the growth cycle being reduced to eight instead of ten days.

At the 8th day the produce, due to the conversion of starch into sugar, has a pronounced sweetish taste very attractive to the human palate. By the 10th day the sweetness is less pronounced and the fibre content of the crop is also a little higher. So far there has been no opportunity for carrying out tests at Auchincruive with crops raised in this new and improved Unit. That will be done in due course, and the relative value of Sprout at the 8th and 10th day ascertained. From work at other centres, however, where crops are being fed on the 8th day, the produce would appear to be even more valuable at that stage than if it is not fed until the 10th day of growth.

II. FEEDING TRIALS WITH DRIED GRASS.

In the cattle-feeding trials that have been reviewed the result from replacing the concentrates in the ration with an equal weight of dried grass has already been indicated. A medium grade of dried grass was found to be scarcely equal in feeding value to the standard ration of concentrates, but, on the other hand, the high-grade dried grass was a little superior thereto.

In these trials the benefit from the inclusion of Sprout, even when dried grass was fed, was very pronounced.

In view of the interest now being taken in the production and utilisation of dried grass, the results from the inclusion of this food in rations for fattening hoggets may be of interest. The feeding trials briefly reviewed here were carried out during the last two winters. In both seasons the hoggets used were Border Leicester Blackface Crosses. The particulars are as follows :—

SHEEP FEEDING EXPERIMENT, 1936-37.

The main objects in view were to ascertain :—

(*a*) the relative merits of swedes when consumed growing and when cut and fed in troughs ; and
(*b*) the result from the replacing of half of the concentrate ration with dried grass.

There were four groups of hoggets, with 32 sheep in each group, a total of 128. They were numbered individually by numbered metal discs tied round their necks and were weighed individually on a very delicate balance. The experiment was continued for a period of nine weeks and the full scheme of rationing was as follows :—

GROUP I. Growing swedes, hay, and concentrates.
,, II. Growing swedes, hay, and half of concentrates replaced with dried grass.
,, III. Cut swedes, hay, and concentrates.
,, IV Cut swedes, hay, and half of concentrates replaced with dried grass.

The allowance of cut swedes was :—

9 lb. daily for the first three weeks,
10 lb. ,, for the second period of three weeks,
and 11 lb. ,, for the third period of three weeks,

averaging 10 lb. per day over the feeding period.

The allowance of growing swedes was not restricted, the sheep being given an additional section before the previous one was entirely cleared up.

The hay allowance was ¼ lb. per sheep daily, but subsequently Groups II. and IV. failed to entirely clear up these amounts on account of the bulk which the dried grass imparted to their rations.

The allowance of concentrates commenced at 1 lb. daily and was increased by 1 ounce weekly to 1½ lb. in the ninth week, thereby averaging 1¼ lb. over the feeding period.

The mixture of concentrates fed consisted of :—

2 parts	Crushed Oats.
2 ,,	Flaked Maize.
1 part	Dried Grain.
1 ,,	Decorticated Cotton Seed Meal.
1 ,,	Decorticated Ground Nut Meal.

In the case of Groups II. and IV., for which dried grass replaced half of the concentrates, the grade of grass fed was that used in cattle-feeding *Experiment D.*, the analysis of which has already been given on page 54. The grass was ground in order that it might be better mixed with the concentrates.

At the end of the nine-week period the sheep were again individually weighed, and immediately thereafter transported to Glasgow for slaughter, in order that the individual carcass weights might be obtained.

All of the hoggets were slaughtered in the course of one forenoon and the carcass weights carefully checked by members of the College Staff. The results obtained were as follows :—

GROUP.	Rations	Live Weight at		Live-weight Increase	Carcass Weight
		Start	Finish.		
		lb.	lb	lb.	lb.
I.	Growing swedes, hay, and concentrates.	85	99	14	50
II.	As Group I., but half concentrates replaced with dried grass.	85	100	15	50·2
III.	Cut swedes, hay, and concentrates.	85	101	16	52
IV.	As Group III., but half concentrates replaced with dried grass.	85	102	17	52·8

It will be observed that there has been a slight improvement both in live weight and in carcass weight from Group I. up to Group IV.

Taking, first, the *growing* as against the *cut* swedes the superiority of the cut swede ration is fairly well established, particularly in the increased carcass weight that resulted. This conclusion is in keeping with the results of previous trials.

The replacing of half of the concentrate ration with dried grass cannot be said to have effected any material improvement, but it is clear that it can be used to replace at least half of the concentrates without the rate of progress being adversely affected. Further, when it is included there is less need for feeding hay. The fact should also be kept in view that the grade of dried grass used was only medium in quality.

SHEEP FEEDING EXPERIMENT, 1937-38.

In this experiment there were again four groups of hoggets, but, in view of the large number of sheep available, the numbers were increased to 40 in each group, a total of 160 in all.

The scheme of experiment differed from that of the previous year in that all of the sheep were fed on cut swedes. Further, two grades of dried grass, a high grade and a medium grade, were included. In addition thereto the experiment was continued for a period of twelve weeks instead of nine weeks.

The daily allowance of swedes commenced at 9 lb., and was gradually increased to a maximum of 11 lb. per sheep.

The concentrate allowance commenced at 1 lb. per sheep, and was gradually increased until it reached a maximum of 1½ lb.

The concentrate mixture was similar to that of the last experiment, excepting that one part of Linseed Cake Meal replaced one part of Decorticated Earth Nut Meal. The two grades of dried grass used in the trial were those used in cattle-feeding *Experiment E.*, and their analyses are given on page 56. The hay allowance for Groups I., II., and III. was ¼ lb. daily. Group IV. were given ¼ lb. medium-grade dried grass instead of hay.

The full scheme of experiment was as follows :—

GROUP I. Control ration of cut swedes, hay, and concentrates.
,, II. As Group I., but with half of the concentrate mixture replaced with high-grade dried grass.
,, III. As Group I., but with half of the concentrate mixture replaced with medium-grade dried grass.
,, IV. As Group I., but with hay allowance replaced with ¼ lb. of medium-grade dried grass.

As in the previous trial each sheep was numbered with a metal disc tied round its neck and the individual weights at the beginning and end of the feeding trial were duly recorded. Each group was also distinctively marked with keel to make separation easy in the event of any mixing occurring.

Dried grass when fed in the amount indicated constitutes a bulky food, and, as the allowance increased, Groups II. and III. took a considerable time (approximately three-quarters of an hour) to clear up the full amount.

When the dried grass was used to replace the hay it was not ground and fed in troughs, but in the ordinary hay rack which was lined with netting to prevent waste. This was found to be a very convenient method of feeding dried grass and one that permitted of its being consumed without any waste.

The results from this feeding trial were as follows :—

Group	Ration	Average Live Weight		Live-weight Increase	Carcass Weight
		Start	Finish		
		lb	lb	lb	lb
I.	Control ration, swedes, concentrates, hay.	82	99½	17½	48·2
II.	Half concentrates, replaced with high-grade dried grass.	82	106·8	24·8	52·5
III.	Half concentrates, replaced with medium-grade dried grass.	82	105·4	23·4	52
IV.	As control, but with hay replaced with ¼-lb. dried grass.	82	102·7	20·7	50·6

It will be observed that the replacing of half of the concentrates with high-grade dried grass or with medium-grade dried grass has given a marked increase in live and in carcass weight. Also that in the case of Groups I. and IV. the replacing in the latter of ¼ lb. hay with ¼ lb. of medium-grade dried grass has effected a substantial improvement in live-weight increase and in carcass weight. It should be noted, however, that Group I. was all along at a slight disadvantage as it included a considerable number of lame sheep which lowered the average progress of the Group as a whole. When allowance is made for this the superiority of Groups II., III., and IV. over Group I. is less pronounced.

SUMMARY AND CONCLUSIONS.

Sprout has now been used in six different cattle-feeding trials and Dried Grass in two cattle-feeding and two sheep-feeding trials, and from the results it would appear that in Sprout and in Dried Grass we have two very valuable additions to the foods available for stock feeding.

As regards the amount of Sprout to feed to cattle, whilst it may be used to replace as much as 30 lb. of swedes (13½ lb. Sprout), it would appear as if there was no benefit from including the equivalent of more than 20 lb. swedes (9 lb. Sprout) other than in the cutting down of the swede ration. Further, the inclusion of Sprout equivalent to 10 lb. swedes (4½ lb. Sprout) gives much the same response as the larger quantity.

The practical importance of this result lies in the fact that, as the smaller amount gives the desired stimulus to progress, halving the allowance of SPROUT doubles the number of cattle that can be SPROUT-fed from the same output—for example, a unit with an output of one ton of SPROUT per week would only serve for 35 cattle if the allowance was equivalent in dry matter to 20 lb. of swedes (9 lb. SPROUT), but at the equivalent of 10 lb. swedes (4½ lb. SPROUT) 70 cattle could be supplied with SPROUT and benefit from the inclusion of this stimulating agent in their ration.

Where it is desired to reduce the allowance of swedes for fattening cattle, that can be effected by the inclusion of SPROUT equivalent in dry matter content to at least 30 lb. swedes daily.

In feeding for beef, dried grass may be used to entirely replace other concentrates; high-grade dried grass proved rather better than the standard ration of concentrates, but medium-grade dried grass was not quite equal to the standard ration.

The inclusion of SPROUT in a ration containing dried grass brings a further marked response, which would seem to indicate that, valuable though dried grass undoubtedly is when included in a winter ration for cattle, it nevertheless fails to fulfil some function in animal metabolism that SPROUT would seem to discharge.

The inclusion of SPROUT in a winter ration improves the quality of the beef.

The use of SPROUT in winter feeding for beef is a sound economic proposition.

Dried grass would seem to be a specially valuable component of a ration for sheep that are being fattened on turnips, and as much as half of an ordinary concentrate ration can safely be replaced with dried grass. When included to that extent both high-grade and medium-grade dried grass have proved slightly superior to a standard ration of concentrates. A drawback from the inclusion of a bigger proportion of dried grass in the ration is the excessive bulk, the time taken to consume the ration, and the tendency in windy weather for some of the grass to be blown out of the troughs. This, of course, does not result when the dried grass is made into and fed as cubes.

The inclusion of dried grass in a winter ration for fattening hoggets substantially lowers the consumption of hay.

NOTE OF ACKNOWLEDGMENT.

The writer gratefully acknowledges the assistance of all who helped in the carrying out of the various feeding trials. In particular, he desires to thank Mr James Cochrane, the Supervisor of Experiments, for carrying out so efficiently the large amount of work involved in these trials, and Dr M'Arthur and his Staff for the large amount of analytical work that had to be undertaken.

RATS AND MICE.

By R. STEWART MACDOUGALL, M A , D Sc , LL D.

HUNGER and love are two great impelling and compelling forces in life; hunger relating to the upkeep and prosperity of the individual, and love in its relation to the provision for the future of the race. Associated with these are the 'fitnesses' that enable the animal to succeed in the struggle for existence and the skill and power the animal shows in adapting itself to a varying environment. Applying the foregoing to the rat and reviewing rats' responses to their surroundings, it is not difficult to understand why the rat stands out prominently among man's 'pests' as so successful, and very difficult to combat.

The rat can walk; can run; can leap; can burrow (the Brown Rat more naturally, actively, and willingly than the Black Rat); can climb (the Black Rat is the more agile and much the better climber); can swim (the Brown Rat, more at home in the water, is the better swimmer and takes more readily to the water).

Further, rats have great powers of multiplication, coming to maturity early, breeding all round the year when favoured by food and temperature; the period of gestation is short; a new mating may follow at once on parturition. In the Brown Rat the mother may still be suckling her young while at the same time she is nourishing internally a new generation of fœtal embryos. A number of litters is therefore possible in a year and the number in a litter is high.

Still again, it is almost impossible to starve the rat; if one food fails it takes to another (the Black Rat is the more circumscribed in its diet).

Again, one remembers the intelligence of the rat, its wariness, its 'diabolical' cleverness, its friendly social relations, the care for its young, its 'two o'clock in the morning' courage, its readiness in defence and attack.

POSITION OF RATS AND MICE IN THE ANIMAL WORLD.

Rats and mice are mammals—that is, they are warm-blooded, breathe by lungs throughout life, produce their young alive, and suckle their young. They belong to the Order of mammals known as Rodents or Gnawers.

The rodents are the most numerous and most widely distributed of mammalian orders. Most of them live on land; some live in trees—*e.g.*, there is a family of tree rats, and squirrels are almost arboreal; a few, like the beaver, are aquatic. The rodents are characterised by their large chisel-edged incisor or front teeth; these incisors have no roots, but grow from persistent pulps. A lower pair of incisors (there is only one pair of incisors in the lower jaw) meets an upper pair; there is a continual wearing down of the gnawing edges, and a gradual renewal or addition from the continuous replacing growth. The chisel-like gnawing edge of these incisor teeth is due to the hard enamel of the front part of the tooth not wearing away so fast as the softer dentine behind. Rodents have no canine teeth, and so there is a distinct space between the front teeth and the cheek teeth.

The rodents are divided into two sets—viz., the Double-Toothed Rodents (*Duplicidentata*), with two pairs of upper incisors (the second pair are very small and lie behind the first pair) as in the hare and the rabbit; and the Simple- or Single-Toothed Rodents (*Simplicidentata*) with only one pair of upper incisors. In the Single-Toothed Rodents come rats, mice, voles, lemmings, hamsters, the musk rat or musquash, dormouse, beaver, squirrel, flying squirrel, woodchuck, prairie dog, the jumping mouse or jerboa, porcupine, coypu or nutria, guinea-pig, chinchilla, and the capybara of South America, (the largest of all the rodents). The British forms in the above lists are the hare, rabbit, dormouse, squirrel, rat, mouse, vole.

Rats, mice, and voles separate themselves out from all the other British rodents in having only three pairs of cheek teeth (molars) in each jaw, and they constitute the family *Muridæ*. The *Muridæ* family is divided into two sub-families, the *Murinæ* and the *Microtinæ* here contrasted:—

Murinæ.	*Microtinæ.*
The true rats and mice.	The voles.
Not so heavy in build and the body more slender.	Body plumper.
Muzzle more pointed.	Muzzle blunter and rounder.
Ears more prominent.	Ears hidden in the fur (the ears of the Bank Vole, however, are conspicuous).
Tail long—about as long or longer than the head and body—and not hairy.	Tail short—never at the most more than half as long as head and body—and distinctly hairy.

The inquiring student will notice, too, that in the true rats and mice the cheek teeth (always rooted) have cusps or tubercles, while the cheek teeth of the voles (rootless except in the Bank Vole) have smooth and more or less triangular crowns.

There are three British voles—viz., the Water Rat (so called), the Bank Vole, the Field Vole.

Running the true rats and mice into their own corner of the animal world as an easy lesson in classification, we get this :—

Kingdom .	Animal.
Phylum .	Vertebrata (have a backbone).
Class . .	Mammalia (suckle their young).
Order . .	Rodentia (gnawers with chisel-edged, rootless incisors or front teeth).
Sub-Order .	Simplicidentata (one pair of incisors in upper jaw).
Family .	Muridæ (only three pairs of cheek teeth).
Sub-Family .	Murinæ (the crowns of the cheek teeth have cusps or tubercles and these teeth are rooted).

Listing the British rats and mice, we get the Black Rat; the Brown Rat; the House Mouse, with its variety or subspecies the St Kilda Mouse; the Long-tailed or Wood Mouse, with its varieties as given by Barrett-Hamilton—viz., the Fair Island variety, the Hebridean variety, the St Kilda variety, and the Yellow-necked variety (from different parts of England); and lastly, the Harvest Mouse. We shall look at these in turn.

The best way to distinguish the two rats is to contrast them in parallel columns :—

Black Rat.	*Brown Rat.*
Known also in the literature as the House Rat, the Ship Rat, and the Old English Rat.	Known also as the Norway Rat and the Sewer Rat.
The technical name is— *Epimys rattus,* or *Mus rattus,* or *Rattus rattus.*	The technical name is— *Epimys norwegicus,* or *Mus norwegicus,* or *Mus decumanus.*
Adult smaller, up to 7½ in. without the tail.	Adult up to 10 in. without the tail.
Tail as long or longer than head and body.	Tail shorter than head and body.
Lighter in build, with the muzzle rather more pointed.	Heavier in build, with the muzzle blunter.
Ears thin and not hairy.	Ears thick and hairy.
Ears large, one-half the length of the head.	Ears smaller, one-third the length of the head.
More a domestic indoors species, living, where it occurs, in close relation to human beings. (It may, of course, be found in the open.) Is the typical rat of ships.	More the rat of out-of-doors (but, of course, may be got in houses); hardier and more fitted for an outdoor life, living in sewers, drains, hedgerows, ditches, the foreshore, refuse dumps. (See later, under "Habits.")

Black Rats are often brown, and Brown Rats are often black. Dark varieties of the Brown Rat are sometimes mistaken for and reported as the Black species. It will be seen later, when we come to diseases spread by rats, that it is of importance to know the one rat from the other.

Hinton [1] separates the two species as follows :—

The Black Rat.—" Back black, belly smoky-grey. Fur on back longer and rather harsh, on belly short, sleek, and adpressed. This is the type characteristic of the cold temperate countries of Europe, but in North Africa and Asia Minor the variety known as the Alexandrine Rat has the back brownish-grey, the belly more or less dingy, the upper and under colours merging insensibly into each other on the flanks. The various colour varieties interbreed freely when they meet."

The Brown Rat.—" Back greyish or reddish-brown, heavily lined with black hairs along the spine; belly silvery-grey, but in many specimens washed with a dingy yellowish-brown."

THE BLACK RAT.

This rat is native in Asia and from Asia it spread westwards. The commercial and other relations due to and following the Crusades in the eleventh and twelfth centuries contributed largely to the entry of this rat to Europe and to Britain. The Black Rat is a 'great mariner' and came in ships, as it does to the present day (often in numbers), though now prevented to a great extent from landing by

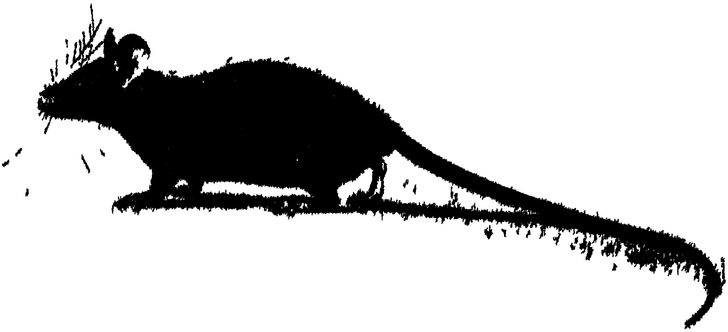


Fig. 17.—*The Black Rat.*

From 'Rats and Mice as Enemies of Mankind,' Economic Series No. 8, by M. A. C. Hinton, Keeper of the Department of Zoology. By the courtesy of the Director of the British Museum (Natural History)

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[1] 'Rats and Mice as Enemies of Mankind,' by M. A. C. Hinton, Department of Zoology, British Museum of Natural History.

rat-guards on mooring-lines and hawsers; there is control, too, by the watch and inspection of municipal and dock and sanitary authorities. On reaching England the Black Rat multiplied and spread, and in course of time became, and till about the beginning of the eighteenth century or a little later remained, a most formidable enemy by entering, and breeding in, houses and storehouses, by devouring grain and other foods and by ruining property.

In the Middle Ages here and there in Europe and elsewhere there were years when the rats abounded even more than usual. One can read how such plagues were regarded as a chastisement from Heaven for man's sins, how days of prayer for the removal of the curse were held, and how the man in the street chanted rat-rhymes as a charm. One such infestation seems to have taken place at Hamelin in Germany, on which Browning founded his legendary story of the Pied Piper.

> " Rats !
> They fought the dogs and killed the cats,
> And bit the babies in the cradles,
> And ate the cheeses out of the vats,
> And licked the soup from the cook's own ladles,
> Split open the kegs of salted sprats,
> Made nests inside men's Sunday hats,
> And even spoiled the women's chats
> By drowning their speaking
> With shrieking and squeaking
> In fifty different sharps and flats."

Soon after the beginning of the eighteenth century the Black Rat had to contend with the now introduced Brown Rat and quite failed in the competition that followed. Milder in disposition and not so hardy, the Black Rat proved no match for the quickly multiplying Brown Rat. In half a century's competition the Black Rat was a dwindling and disappearing species in Britain. This was not the result of actual fighting or the tearing in pieces of the Black Rat by the Brown, though in any fight the Brown would be the victor. The competition was more subtle than actual combat, for the Brown Rat is more fertile than the Black, has a greater adaptability, a wider range of food, and greater hardihood and enterprise in outdoor life.

Still, here and there isolated colonies of the Black Rat continued to exist. Sometimes, too, there was a new entry from ships wrecked near the mainland or in the neighbourhood of an island. Records quoted in Barrett-Hamilton[1] and in Millais[2] prove that the Black Rat was well enough known in Scotland in the early part of the nineteenth century: Forfarshire in 1813; common in Aberdeenshire till about 1830; Moray till 1830; inhabiting the garrets of the high houses in the old town of Edinburgh in 1834, and said to be completely exterminated in 1838; Perthshire in 1879, when Millais got two from a small colony in a shop at Dunkeld; Shetland in 1880. In March 1931 the Black Rat was reported from Leith and a specimen was presented to the Royal Scottish Museum. The Black Rat was also common in Ireland.

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[1] 'A History of British Mammals,' Parts 1 to 21, by G. E. H. Barrett-Hamilton and M. A. C. Hinton (Gurney & Jackson).

[2] 'The Mammals of Great Britain and Ireland,' by J. G. Millais, F.Z.S.

There is increasing testimony that the Black Rat is getting commoner again in Britain. Hinton writes: "During the present century the Black Rat, favoured by rebuilding and the rat-proofing of basements, which have shut out the Brown Rat, and by the extension of the telephone system and the removal of kitchens from basements to roofs, has succeeded in re-establishing itself in many of the chief cities of Britain."

Worse than its destruction to foodstuffs and property is the part the Black Rat plays in disseminating Plague or Black Death. Every schoolboy knows 1665 as the date of the Great Plague in London which wiped out one in six of the population, and earlier and later in other centres there was much loss of life. Between 1906 and 1908 in India, where the Black Rat is native and successful, over 6,000,000 people died of Plague.

In 1894 it was scientifically proved that the cause of Plague was a bacterium (*Bacillus pestis*). The rat is the normal host of this bacillus, which gives rise to swellings or buboes (Bubonic Plague); plague-stricken rats die off in numbers. The disease is spread from rat to rat by a rat-flea. So many rats die that the infected flea, in absence of its normal host the rat, leaps on to man, and in feeding communicates the bacillus which is the cause of the disease.

Long before the rat's association with Plague had been scientifically proved, the rat had been under suspicion. The word 'emerods' in 1 Samuel, chapter v., verse 6, has been variously translated. One of the offered translations is tumours or plague buboes. The Philistines, as told in the Scriptures, smitten with Plague, returned the Ark of the Covenant with an offering of golden images of "the rats that mar the land." Dr Louis W. Sambon, taking the view that the Black Rat was known earlier in Europe than crusading times, ascribes the emblem of Medicine—the snake-entwined staff of Æsculapius—to the use of snakes as destroyers of the rat. But perhaps we are on surer ground if we associate the badge of Medicine (the badge of the R.A.M.C.) with that wonderful leader Moses (about 1491 B.C.), the greatest of commissariat officers, as the late Lord Rosebery called him, and, may I add, the first of M.O's. The Israelites under Moses had been attacked by a plague of fiery serpents, a species of parasitic round-worm. This parasite, known as the Guinea Worm, gives rise to severe ulcers under the skin. When this worm is mature it protrudes from the ulcer and is drawn from the patient by the careful rotation of a small rod, round which the worm is entwined and carefully drawn out.

Both the Black Rat and the Brown Rat can act as the host of the bacillus of Plague and be the reservoir from which the rat-flea becomes infected, but the Black Rat, because of its closer association with man in his dwelling, is far the more dangerous. In the 1665 Plague of London the Black Rat was the sole culprit, as the Brown Rat had not yet reached England. In view of the risks of Black Rats reaching England in ships from places abroad where Plague may exist, port and sanitary authorities are ever on the alert, rat destruction being accompanied by bacteriological examination to determine whether or no the rats are infected. I have above stressed the importance of constant watchfulness, the need for it emphasised by the small outbreaks of Plague in East Anglia in 1906-07, and in Glasgow in 1890 and 1891.

I have said above that all down the years rats had been suspected of connection with Plague. A Lord Mayor, dealing with Plague outbreak, ordered the destruction not only of all rats but also of the innocent and helpful dogs and cats, giving with the right hand and taking away with the left. Truly "a little learning is a dangerous thing." But it is the 'littleness' and not the learning that is dangerous. Here is a pathetic example. In the course of the excavations at the first Panama Canal scheme many thousands of navvies died of malaria and yellow-fever. The kindly nuns in charge of the hospital diligently watered the flower-beds and lawns to make the surroundings attractive, thus innocently supplying the water necessary for the breeding of the disease-carrying mosquitoes.

THE BROWN RAT.

This rat is also an alien: its native home is temperate Asia. A short two hundred years ago or so we had no Brown Rats, and yet now the Brown Rat is spread over England, Scotland, and Ireland. The year 1764 is given for the appearance of the Brown Rat in Scotland, and it had reached the north in 1814.

From Asia the Brown Rat spread westwards. There is a record of a great invasion of Eastern and Southern Russia in 1727, when hordes crossed the River Volga in search of food, driven, as the report has it, by an earthquake. Ships brought the rat to Britain (1727-29). Later it was carried to the

United States and is now cosmopolitan, prospering and increasing in countries not too hot and not too cold.

The Brown Rat is an out-of-doors rat as long as actual need for shelter from weather does not drive it indoors. Though found in dwelling-houses this rat is not, in comparison with the Black Rat, a domestic rat. In the open the Brown Rat abounds in hedgerows and ditches; in river banks (water is a necessity and a means of spread); on the foreshore; in drains and sewers. At other times it infests outbuildings, stables, cow-byres, slaughter-houses, refuse dumps, granaries, barns, poultry-yards, and wherever food is scattered. Stacks earlier or later in the season (if they can be reached) are great places for food and shelter. "A stack is a home built of food."

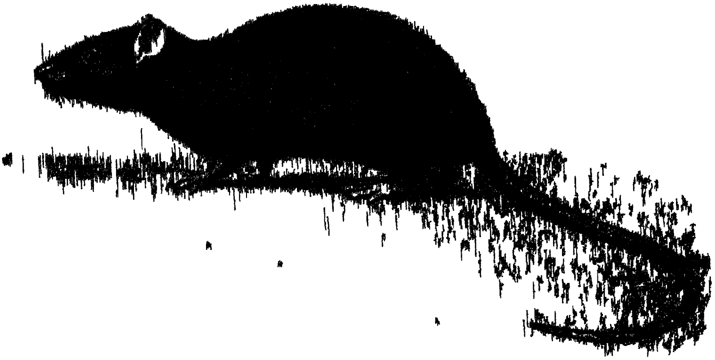

Fig. 18 —*The Brown Rat.*

From 'Rats and Mice as Enemies of Mankind,' Economic Series No 8, by M A C Hinton Keeper of the Department of Zoology By the courtesy of the Director of the British Museum (Natural History)

What a range of food these rats have—vegetable and animal! According to the season, according to the locality, according to opportunity, they feed on grain of all kinds, dog-biscuits, meal and other stored cereals, potatoes, turnips, carrots, beans (they sometimes bite off and collect the pods and in a place of shelter neatly shell them), apples, melons, pumpkins, the bark of fruit trees, mushrooms, eggs (how do they carry them away?), young game-birds, chickens, ducklings, pigeons, young rabbits (the rat is a persistent hunter of young and small vertebrates), sheltering moths (after removal of the wings), crabs, shrimps, prawns, mussels, and all the flotsam and jetsam of the seashore.

The feeding-place may be near their nesting and sleeping-place or it may be a considerable distance away. Food may be conveyed to a temporary hiding-place to be dealt with soon or be placed in store in a burrow or near the feeding-place. One such store contained numerous knots of sugar, and in another were 1½ lb. sugar, a pudding, a stalk of celery, a beet, carrots, turnips, and potatoes. Much is wasted that is not eaten. Then there may be great destruction of property. They gnaw through floors and walls and lead pipes, sometimes giving rise to an overflow of water or an escape of gas (a portion of a gnawed-through gas-pipe has come to me with the tooth-marks clear); they interfere with drains; they have in recent years proved a pest in aerodromes; and they also bite through the insulating material of electric wires, a type of damage several times reported to me.

They destroy furniture, upholstery, leather goods, and articles of clothing. Millais quotes the case of a London restaurant where 1728 gnawed serviettes were found, and in 'The Field' of 10th January 1891 (quoted by Barrett-Hamilton) it was stated that "a single nest contained 3 towels, 2 serviettes, 5 dust-cloths, 2 pairs of linen knickerbockers, 6 linen handkerchiefs, and 1 silk handkerchief."

ROUND OF LIFE OF THE BROWN RAT.

In relation to the farm, the rat spends part of the year in the open in such places as have been already mentioned, including the open fields; the bolt-holes are easy to see and find. When the rats are numerous, the rat-runs, worn bare, will be seen leading from the burrows to the feeding places. Interested observers will also notice the neat footmarks left, for example, on the mud near ponds, or in snow, if the rats have been out in winter; the hand and foot in walking come down in the same place, the footprint showing a little outside the hand. The thorough Scout will verify this in experiment by spreading sand in and near the runs, when in addition to the footmarks he may see the trail of the tail; here and there, too, will be the droppings, not rounded like the rabbit's, but small and spindle-shaped.

The burrows are winding and have several entrances or exit holes. Just before the young are born, the female prepares in the burrow a warm nest for her litter. The newly-born young are pink in colour, naked, blind, helpless, but are carefully tended and nursed; they are weaned in between three and four weeks. The Brown Rat is sexually mature in two months, but in experiment, carefully tended rats have been found pregnant in 35 days.

The rat comes into heat every ten days. The period of gestation is three weeks. A new mating can take place immediately after the birth of a litter. The average number in a litter is eight, but double figures are not uncommon. In a year there are five or six litters. The number of litters to a year and the number of young to a litter vary, depending on the age of the female, the condition of the female, the abundance or otherwise of food, and on the temperature. In Britain breeding can go on for nine months of the year.

As outside conditions become severer and food in the fields scarcer, the country rats take cover in stacks and in buildings.

THE "INTELLIGENCE" OF THE RAT.

Often one hears of the "intelligence" of the rat, and there is the temptation to quote some of the examples given in the literature. But the evidence is often uncertain and observation often faulty.

There have been extremely interesting experiments with rats to test whether they can be educated; for example, the training of rats to come to food at the ringing of a bell, and how successive generations learned after fewer lessons than the preceding generations; and again in teaching rats to avoid electric shocks, when it was claimed that the mistakes made by a much later generation were far less in number than with the first generation submitted to experiment. The experiments recorded have close relation to the theory of the "transmission of acquired characters," but opinions differ as to their interpretation.

ECONOMIC IMPORTANCE OF RATS.

Elsewhere we have referred to the destruction done to food and to property, and Plague, as a rat-spread disease, has received due notice. But there are other diseases carried by rats that have importance. One of these is Trichinosis of Man.

Trichinosis is a disease due to a minute Round Worm (*Trichinella spiralis*), a worm parasite in the rat, pig, and man. Rats become infected by eating waste infected pork, or perhaps in infested excrement, and from the rat the disease may pass to the pig. Immature young worms lying encapsuled in the infected rat's flesh are swallowed by the pig. In the pig's intestine the capsules are digested and the tiny worms set free. The worms become adult in the pig's intestine, where they pair. Soon there are born thousands of microscopic Trichinæ which bore through the wall of the pig's alimentary canal and encapsule themselves in the flesh of the pig. The minute worm in the capsule can go no farther unless the flesh be eaten by an appropriate host. If man, for example, eats such pork raw or not sufficiently cooked, the immature worms are set free in man's alimentary canal, later to become adult and mate there. The young worms of this new generation bore their way to the man's muscles in thousands and take up their stay there. Trichinosis is a serious, exhausting disease in man. Fortunately it is not common in Britain, though not so long ago in one of our large abattoirs 3 per cent of the pigs slaughtered were found infected with this worm.

The rat is also the host of a tapeworm of human beings, and is further suspected of conveying a disease of horses from stable to stable.

There is also danger of disease from food contaminated by the rat's excrement.

CONTROL.

I have refrained from quoting figures as to the number of rats in Britain, and of the possible progressive power of multiplication in a year. Such estimates vary. For our purpose it may not be an exaggeration to say that the rat population equals our own, and that the annual losses—direct and indirect—amount to millions of pounds sterling. Those interested wonder that the figures and the losses do not make a greater impression on the man in the street. But the fact is that while he reads the figures he may not himself be brought into actual contact with rats, and may see little or nothing of them. Even in the country, interest is not so keen as in comparatively recent times when it was harder to get about and when rat-catching was a sport, or almost a sport, and a man keen to prove the prowess of his terrier as a rat-killer.

As a result of strong representations by interested and competent observers and authorities, there was passed in 1919 "The Rats and Mice Destruction Act," which came into force on 1st January 1920. By this Act the "occupier" of land—*i.e.*, the owner or tenant of "land" ("land" includes any buildings and any erection on land, and any cellar, drain or culvert in or under land), is responsible for the destruction of rats and mice, and for preventing the land becoming infested with rats and mice.

Local authorities and municipal bodies and port sanitary authorities are charged with the duty of executing and enforcing the Act. Responsible authorities are urged to enforce collective action. The fairness and importance of this is manifest, for an owner or occupier ought not to be put to trouble and expense simply to have his land or premises reinfested from neighbouring places left untreated.

The task of controlling rats may well seem an almost hopeless one, but already county councils and municipal and port authorities have, as a result of experience and experiment, knowledge sufficient to carry out effective treatment, though more money would often be welcome.

As regards rural areas in Scotland the Department of Agriculture, through its experts, is able to give helpful and practical advice in methods of poisoning, trapping, rendering granaries and other buildings rat-proof, &c.

The man in the street should understand that the complexity of the rat and mouse problem necessitates a team of workers in departments, municipalities, rural areas, ports, &c.: zoologists with an interest in and a knowledge of "the way of the rat"; chemists with a knowledge of poisons; medical experts with a knowledge of diseases; parasitologists who have studied the external and internal parasites associated with the rat; engineers skilled in sanitation and modes of defence. Nor must we forget the rat-catcher himself, whose useful work deserves acknowledgment. I have read somewhere of a successful appeal made by a professor on behalf of a student in an agricultural college who faced being 'sent down' for some breach of the college regulations; the student was saved on the plea that he was "the best rat-catcher in the college." In olden days the rat-catcher could hold an official position and might have a special uniform. "Among other officers," wrote Pennant[1] in 1812, "his British Majesty has a rat-catcher distinguished by a particular dress, scarlet embroidered with yellow worsted, on which are figures of mice destroying wheat-sheaves."

The problem of rat control is more difficult for the farmer than for the urban resident, and the measures adopted against rats may differ according to local conditions. Still, it is convenient to discuss control in general under the two main headings Preventive Measures and Means of Extermination.

Preventive Measures.

The number of rats and their fecundity are conditioned by the abundance of food, and comfortable cover and shelter-places for the rearing of the brood is also important. Therefore access to food and shelter should be rendered as difficult as possible:—

By keeping food stores protected at all times.

By remembering, when actively fighting the pest, that the hungrier the rat the more likely to fall to trap and poison.

By building stacks on supports, and grain stores on piles, 3 feet high, the piles being furnished at the top with metal rat-guards, or these may be quite surrounded by stout wire-mesh.

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[1] 'British Zoology,' by Pennant. Vol. i., 1812.

By the timely removal and destruction of waste. Garbage and waste material from households and markets should not be dumped carelessly, but collected in protected receptacles and removed regularly. In cities and towns the throwing of bread from windows into backgreens or backyards, though with innocent intention, may all the time be encouraging rats.

By remembering that a refuse dump can be a great centre for rat multiplication.

By the "rat-proofing" of buildings and receptacles. In new buildings, with warning beforehand, this, while costing money—with its call for the necessary concrete and steel and galvanised sheet-metal—is not so difficult, but it may well seem an impossible and uneconomical task in old and open farmyard barns and buildings. In old business premises where stores are kept the repairs necessary and the rat-proofing may not only cost money but be very inconvenient, but it is more than worth while, as in no long time the expenditure is made up by the savings resulting from the work.

By attending to the protection of ventilators and basement windows and open drains.

Natural Enemies.

Rats are eaten by fox, stoat, weasel, owl, hawk, buzzard. One is not asking, of course, that foxes be protected to destroy rats, but the stoat and the weasel should not be persecuted; they certainly destroy young rats. Whether even the stoat would go out of its way to tackle a full-grown rat is doubtful, though in a fair fight the stoat should be the victor.

Means of Extermination.

Poisoning.—In rat-infested areas poisoning is the best method of treatment.

In all poisoning work—and in trapping too—amateurish work will not do; there is first of all the choice of a bait, not the easiest of matters to be certain about. In large-scale work it may be that a number of different baits will be wise, to meet varying rat tastes.

The baits should be experimented with for a short time to see which are removed and then the chosen poisoned baits laid. Do not follow up an unsuccessful first trial by an immediate second laying of poisoned baits; let, say, two weeks elapse. One should not treat little by little, but have a large number of baits exposed. The baits should be exposed all at the one time, for other rats, warned by the sight of dead poisoned rats, may refuse the again offered baits. Rats are certainly wary and suspicious, but there is a tendency to exaggerate their cleverness. For example, while in the United States recently, I read in the 'Reader's Digest' (a widely circulated American monthly magazine), as stated by a "Veteran Exterminator": "There are sometimes official 'taster-rats' who sample questionable food. If it contains poison the death of this taster-rat serves as a warning to his fellows. Sometimes they drag their dead comrade along the tribal runways, communicating the danger to the whole rodent community."

POISONS.

There are many different rat poisons, and professional rat-catchers have their own secrets. Till recently strychnine, arsenic, and phosphorus were perhaps the best known and the most used. But these are dangerous to human beings and to domestic animals, and users should have knowledge of the Protection of Animals Act, 1911, which restricts the use of poisoned matter.

As a result of experiment in the United States, two poisons to rats are recommended by the Ministry and Department of Agriculture—viz., Barium Carbonate and Red Squill.

BARIUM CARBONATE.

Barium Carbonate is a mineral poison which has the great advantages of being cheap, tasteless, without smell, and only mildly poisonous. Though a mild poison, and, in the quantity to kill a rat, harmless to domestic animals and poultry, yet the baits should be so placed as to be out of reach of these. Poisoned baits should always be laid by a responsible person, in the late afternoon or evening, and next morning those not taken should be collected and destroyed.

The Ministry of Agriculture recommend the following[1] barium carbonate baits:—

1.	Barium Carbonate powder	1 part by weight.
	Cheese grated (or minced kipper)	,, ,,
	Dripping	,, ,,
	Fine oatmeal	,, ,,

Melt the fat and mix it thoroughly with the dry ingredients to form a thick paste.

2.	Barium Carbonate powder	1 part by weight.
	Rolled oats	2 parts by weight.
	Dripping	1 part by weight.

Prepare as in No. 1. In summer use rather less fat.

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[1] "Rats and how to Exterminate them." Bulletin No. 30, Ministry of Agriculture and Fisheries. Published by His Majesty's Stationery Office, 1935.

3.	Barium Carbonate powder . .	1 part by weight.
	Fine oatmeal	2 parts by weight.
	Castor sugar	1 part by weight.

Rub all the ingredients through a fine sieve and mix well.

A very slight flavour can be imparted by adding a trace of aniseed oil and is an additional attraction. In using the above recipes the quantity to be used for each bait is one small teaspoonful for rats and half the quantity for mice.

The bait can be laid wrapped in small twists of tissue paper.

Red Squill.

Red Squill, sometimes called the Sea Onion, is a plant of the Lily family. It grows on the Mediterranean shores of South Italy and Sicily and also on the African side. It has large onion-like bulbs. The bulbs are dried and then reduced to a fine powder, and this powder is the product used. There are two varieties: a white one, where the powder is known in human medicine for heart and other purposes; and a red one which provides the rat poison. The plant seems specific to rats and mice, for other animals, including man, refuse it because of its acrid taste; if they do take it they vomit and so are safe. The rat and mouse do not vomit, but, like the fairy-tale Scot, keep all they get.

Red Squill baits recommended:—

1.	Red Squill powder . . .	1 part by weight.
	Fine oatmeal or rolled oats .	2½ parts by weight.
	Dripping	1½ „ „

Melt the fat and mix it thoroughly with the dry ingredients to form a thick paste.

2.	Red Squill powder . . .	1 part by weight.
	Fine oatmeal	2 parts by weight.
	Castor sugar	2 „ „

Rub all the ingredients through a fine sieve and mix thoroughly.

Baits of similar quantities should be used as described for barium carbonate.

Buyers and users of Red Squill should ask for a guarantee of toxicity, for in the absence of a uniform toxic standard the commercial Red Squill rat poisons may vary in their poisonous potency.

Other Poisons.

I have already referred to the much used poisons: strychnine with its bitter taste which must be concealed from the rats in the offered baits; phosphorus, also with a taste but not disagreeable to the rat; and powdered white arsenic, almost without taste and smell. In addition to these there is also the very poisonous thallium sulphate, which is without taste and without smell. These four poisons, excellent for their purpose against rats, are dangerous to human beings and domesticated animals.

TRAPPING.

Apart from using traps in places not suitable for the use of poisons, trapping should be practised along with poisoning.

Here again, do not be in too great a hurry. Place the traps in the runs and other likely places and let the rats have time to get accustomed to the appearance of the trap. The choice of bait may be a problem. Mr E. G. Boulenger in a series of testing experiments, taking the number 100 to represent the ideal food or bait, found "oatmeal to stand at 80, tallow at 70, banana at 60, cabbage, dripping, smoked fish, and cheese at 20, and fresh fish at 10."[1] Mr William Dalton, quoted in 'The Listener,'[2] says: "The average man thinks he has to produce some extraordinary bait. This is quite wrong, but let it be said here that it would be quite useless to try to catch a rat in an agricultural area with a piece of herring. Herring isn't a country rat's natural food. You might manage this for a rat in a modern building. An inside rat is more likely to be used to different kinds of food." Remember too, he goes on to say, that the scent of human beings clings, and after scrubbing a trap "don't just before setting the trap, fondle the cat or pat the dog." It is wise to have a large number of baits as well as a variety of baits.

There are many different kinds of trap, some simple in their mechanism, others more complex: spring traps; cage traps which the rats, tempted by the bait, enter but cannot leave; and barrel or lid, water-containing traps of different designs.

A very thorough and practical description, with illustrations, of traps and trapping has been written by Mr R. Sharpe under the title "Rats, how to Exterminate them, and the Taking of Wild Rabbits." This pamphlet has been issued by the Ministry of Agriculture as Miscellaneous Publication No. 22. Mr Sharpe gives hints on laying traps and of trapping rats in their runs, at the mouth of their holes, in wet ditches, at the mouth of drain-pipes, and in dry country; he also describes the uses of the rat-snare. In addition to Mr Sharpe's notes on water-containing traps, the reader might consult Captain Fuller Maitland's "Notes on Rat Traps" in the 'Journal of the Board of Agriculture,' October 1917.

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[1] See "The Report on Methods of Rat Destruction," by E. G. Boulenger, in 'Proceedings of Zoological Society,' 1919; also published separately as a pamphlet and should be consulted; and the volume, 'Rats and How to Destroy Them,' by Mark Hovell (Bale and Danielsson, 1925).

[2] 'The Listener,' 10th November 1937.

Regarding water-traps a simple form was described many years ago in the 'Journal' of the Royal Agricultural Society of England: "Cover one end of a barrel with a lid of stiff stout paper, tie the edge round the barrel: place a board so that the rats may have easy access to the top; sprinkle 'feed' for the rats on the paper for several days, until they begin to believe they have a right to their daily rations from this source; then place in the bottom of the barrel a piece of rock, six or seven inches high, filling with water until only enough of it projects above the water for one rat to lodge upon. Now replace the paper, first cutting a cross in the middle, and the first rat that comes to the barrel-top goes through into the water and climbs up the rock. The paper comes back to place and the second rat follows the first. Then

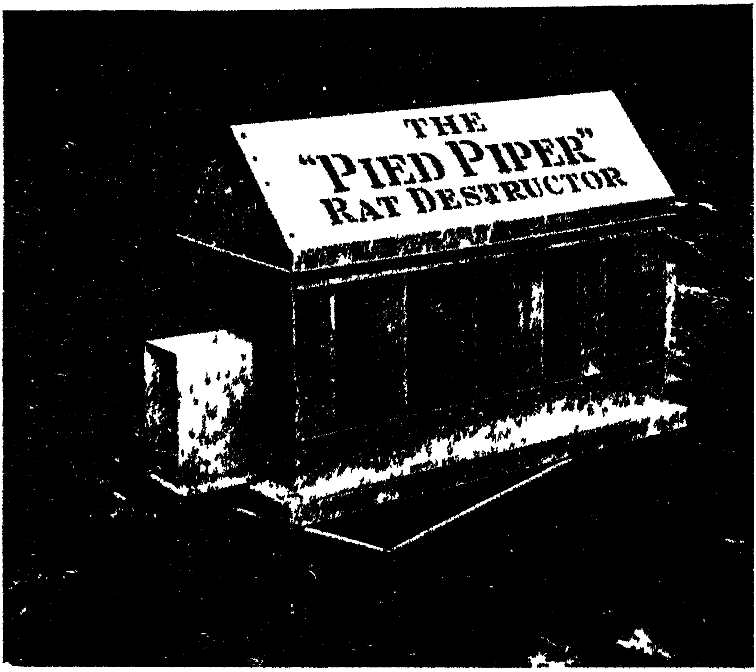

Fig. 19.—*The Pied Piper Trap with the Food-Container slightly displaced to expose the sunk Tank.*

Methods of poultry feeding are now changed, but this trap, when modelled, could also be used as a poultry feeder; the open side openings allow the poultry to feed.

begins a fight for the position on the dry part of the stone, the noise of which attracts others who share the same fate."

A trap, which received a Silver Medal award at the Highland and Agricultural Society's Show in July 1922 and has also received the approval of the Department of Agriculture for Scotland, has been named "The Pied Piper."[1] This automatic trap is made of galvanised sheet-iron and consists of a covered food-container and a tunnel at each end with entrance; each tunnel has a pivoted chute and below is a water-tank into which the rat falls when the chute acts from the weight of the rat; relieved of the weight of the rat the chute or trap-door automatically comes into position again. A brick at each end served as a stepping-stone to the level of the chute. As with all traps, rats should first be allowed to get accustomed to the trap; in the case of the Pied Piper Trap two pins, when in position, keep the chute from falling, so that for a night or two the rats feed in safety. Then, the period of temptation being over, the pins are drawn out and the chute is ready for the victims.

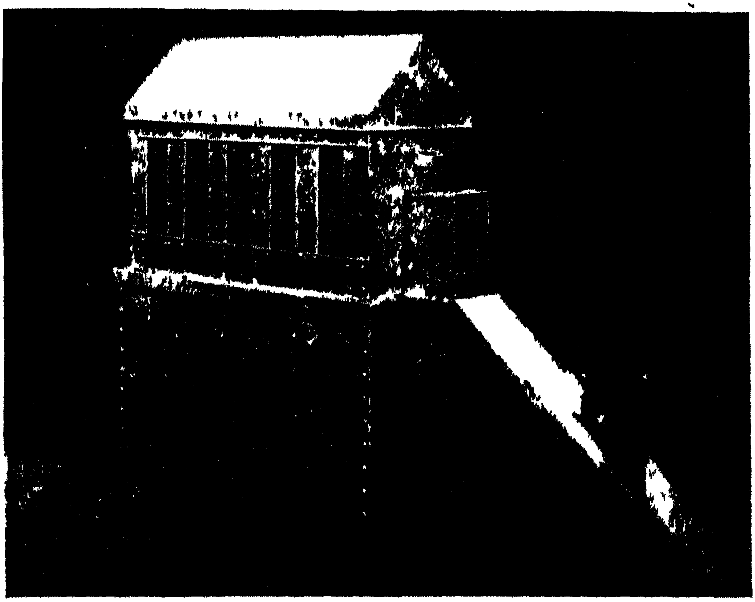

Fig. 20.—*The Pied Piper Trap not sunk but showing the Tank above ground.*

Access is provided at each end for the entry of the rats. It will be noticed that the perforated guards against the feeding of poultry are now in position.

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[1] Invented by Mr R. Stewart, Pinkhill, Edinburgh 12.

Gassing or Fumigation.

This has had proved good results, its chief use being for outdoor burrows and for known shelter-places in the open and for refuse dumps. Machines are sold which generate the gas and then pump or drive it into and through the burrows. Any holes from which the gas may be seen to be escaping are closed with earth. Where exits have been blocked the imprisoned rats are suffocated. To make certain that no bolt-hole has been overlooked is impossible: therefore it is wise to have a terrier on the outlook for bolting rats.

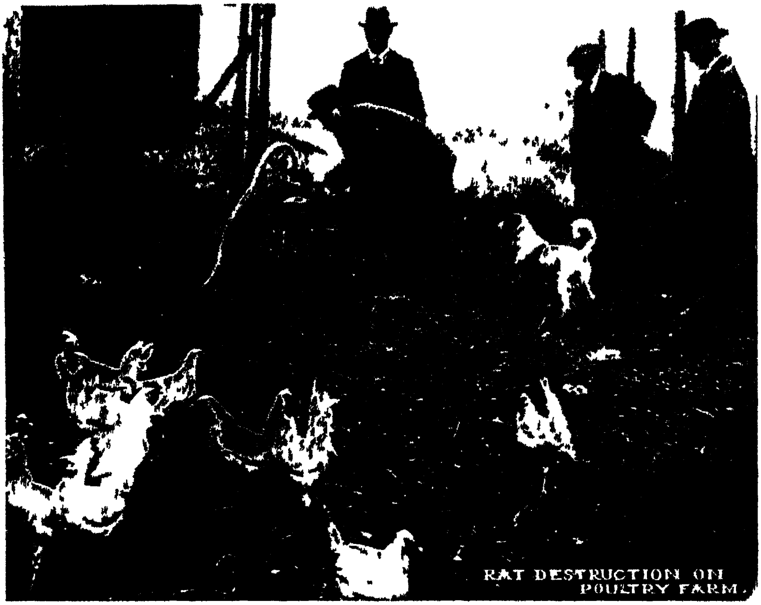

Fig. 21.—*The Clayton Fumigating Machine in action for the destruction of rats on a poultry farm.*

Chlorine and sulphur dioxide are examples of gases used.

Calcium cyanide is also excellent as a dust driven into the burrows. In the presence of moisture (the moisture of the earth) a poisonous gas, hydrocyanic acid or prussic acid gas, is given off, and this asphyxiates the rats. In the use of calcium cyanide a quiet day or a wet one should be chosen so that the liberated gas does not disappear too quickly. One should not inhale the dust and, indeed, with all these poisonous gases care should be taken to breathe in as little as possible. Sometimes calcium cyanide is used with stored grain, the resulting gas freeing the grain from pests. Grain subjected to this treatment does not suffer and can be safely fed to animals after a couple of days' ventilation.

There are various types of machine on the market for fumigating the tunnels and burrows of rats. Fig. 21 illustrates one of these.[1]

Where dangerous poisonous gases are being used the operator is wise to wear a poison-gas mask. To an expert knowing the danger there is really little or no risk.

RAT VIRUSES.

A rat virus differs from an ordinary poison inasmuch as the virus is composed of living bacteria, cultures of which have been made from rats suffering from a specific disease. Bacteria of the culture are added to approved baits. When the baits are swallowed by the rat the bacteria multiply and set up a disease of the rat's alimentary canal of which the rat, after a period of enfeeblement, dies in a fortnight or so. It is possible for one rat to infect another. Suffering rats seek the open, where they die. The Danysz Virus and the Liverpool Virus are examples.

The work is interesting, but space forbids the setting out of detail. It is not unfair, I think, to say after some study of the subject—one of my students too, some years ago, had two limited tests, one with each virus—that other methods are easier of application and surer.

THE RODIER SYSTEM.

This is named after Mr Rodier, who, in Australia, advocated the trapping in numbers of live rats, killing the females, and then setting free the males to fight one another. Enthusiasts for the method urged that the trapped males, before being freed, should be fed for a time on rat's flesh. No sure results can be quoted.

HUNTING.

This is done with ferret and dog. Trained terriers are grand allies. They will be used, too, when ricks are being threshed. In preparation for this the rick or ricks should be surrounded with galvanised wire-netting at least two feet wide.

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[1] The Clayton Fire Extinguishing and Disinfecting Company, 22 Craven Street, London.

COMMUNITY WORK.

All the methods of control should be brought into play wherever the conditions allow. It is most important that fighting the rat should not be an individual thing only, but a community campaign. Hence the wisdom of having rat clubs and committees for areas. In connection with rewards and prizes, some years ago in Paris payments were made for rat tails, and until caught, an ingenious citizen did quite well for himself with relays of tails made of string and skin.

DEODORANTS.

Where with quick-acting poisons rats die behind wainscoting and other indoor places, there may follow unpleasant odours from the putrefaction of the dead rats.

Zinc chloride and lysol are useful deodorants. The source of the odour having been traced, a small hole should be bored to it; several spoonfuls of the chosen liquid are run in and the boring then closed.

The United States Department of Agriculture and our own Ministry and Department recommend "one half-a-dram of lead nitrate mixed in a pint of boiling water; this added to a pail of cold water in which two drams of salt are dissolved makes a good deodorant solution. A large cloth should be saturated in the solution and hung in the room in which the odour is present."

With all the foregoing aids; with the modern requirements in sanitary arrangements (he would be a bold man who would defend the rat to-day as a scavenger, though in early times the rat helped to clear animal and vegetable refuse); with improvements in building which make invasion and shelter difficult for the rat; with the enormous annual destruction of rats; with the prominence given to Rat Week by the Department of Agriculture and the Press; with a more general acceptance of the folly of allowing the enormous money losses due to rats—the war against the rat should be won. The fight should not cease with Rat Week, but be continuous, Rat Week ranking as a week of special effort, as an annual reminder of the loss and danger due to rats and as a renewed call to the citizen to maintain a high civic standard against waste.

THE HOUSE MOUSE (*Mus musculus*).

This well-known mouse, originally a native of Central Asia, is now world-wide in distribution. It has been known in Europe for hundreds of years. It is slender in build, with soft fur here and there bristly; the ears are large, reaching, but not covering, the eyes, if pressed forwards; the tail is long. *Mus musculus* climbs well, is a good jumper, and can swim well enough if forced to.

Enthusiasts are wont to write kindly of the House Mouse as single specimens, though not when it appears in troops. [1] "This is the mouse which, while we sit by the fire, comes out and flits about the white hearth like a movable blot, seeming to amuse itself by appearing in all manner of unexpected places. We would gladly spare it if it were guaranteed to be the only one of its kind here. But we know that our kindness would be repaid with a family of half a dozen, and by four more families of half a dozen each before it was three months older. So the cat and the traps are kept very busy, and still the unwelcome breed flourishes in the wall-spaces and floor-spaces of the house.

"The House Mouse is the town mouse, whether he live in a country mansion or in the middle of slums. Our little flittering of the hearth is a combination of fine gentleman and street arab. He takes a pride in his personal appearance, and his vanity evidently extends to delight in the observation of the human being he has adopted as his patron. But it must be observation at a distance. His eyes, set a little wide apart on a rather hatchety face, and prominent, see askance, almost as well as in front. His ears are wide and thin to catch every sound and locate it in the world of strange echoes that a house must represent. His nose is alert for every message in that direction, and the fine bristles on his muzzle stand for a sixth sense of which we have no conception. He is the figure of watchfulness against danger, and also the figure of curiosity and daring up to the very gate of danger."

The House Mouse is very prolific. Mature in three months, it has a gestation period of three weeks, a number of litters in a year with five young to the litter (the number can be less and more). The female has ten teats. The young, naked, blind, and helpless at birth are able to fend for themselves in three weeks. The nest is made of any soft material. I have taken a newly-born family amid the soft and woolly contents of a lady's work-basket, and some years ago two lady naturalists recorded in 'The Scottish Naturalist' the finding in a rick of wheat that was being threshed a collection of sixty-one young house mice all huddled together in a space seven inches in diameter, some of them only a day or two old, others a little older. In the house, the mice find shelter in all sorts of places, and can be very destructive by gnawing through woodwork, injuring furniture, and making holes in clothing. Apart from dwelling-houses, these mice can be most troublesome in stacks, granaries, and in food stores. They eat all kinds of house comestibles and stores, and one recalls the old greeting—

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[1] 'The Nation,' 24th April 1909.

> "A guid New Year tae ane and a'.
> May the mouse never leave your meal barrel
> wi' a tear in its e'e."

But there were no kindly greetings to this mouse in Australia when in 1916-17 they did damage (aided by other species) estimated at £1,000,000 to great stores of grain that had been collected for war purposes, but could not be distributed at once because of the submarine menace. Some idea of their enormous numbers (food abounded and was easy to get) may be got as recorded by Mr Hinton: "One farmer put down poisoned meat [1] in his house, and next morning he picked up 28,000 dead on his verandah. In a wheat-yard 70,000 were killed in an afternoon." As so often happens in such mass infestations, Nature did something to redress the balance, for disease broke out among the mice, which died in tens of thousands.

VARIETIES OR SUB-SPECIES OF THE HOUSE MOUSE.

In view of the now world-wide range of *Mus musculus* it is not surprising that a number of varieties have been described; perhaps some day in the course of evolution to be regarded as species. A very pale variety has been described from an isolated tract in Dublin Bay, the habitat being sand-hills, the pale colour of the mouse harmonising with the colour of the sand and so giving it some protection.

Then partly through the collections of the late Dr James Waterston and Drs Annandale and Marshall, and Barrett-Hamilton, two very definite varieties or sub-species of the House Mouse have been separated, one of them the St Kilda Sub-species (named *Mus muralis*), a larger, more robust house mouse with the upper surface sepia-brown.[2]

That one should get a variety of mouse in a more or less distant island (apart from the St Kilda Mouse there is a second variety in the Faroe Islands) is not difficult to understand. Immigrant mice that reach the island may vary in a different environment and along a line that may prove in some way helpful. The island is circumscribed, and in a small area there is a greater chance of individuals with similar variations meeting and mating. In the course of time the advantageous variation may become accentuated sufficiently to end in individuals so differing from the original type or species as to justify them being ranked as sub-species or even species.

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[1] The House Mouse does not confine itself to a vegetable diet.

[2] A student of the Family will find details in: 'The History of the British Mammals,' by G. E. H. Barrett-Hamilton, 'The Journal of the Birmingham Nat. Hist. Society,' April 1895; 'The Zoologist' for 1895, and an article by W. Eagle Clarke in the 'Proceedings of the Royal Physical Society,' Feb. 1924.

MOUSE CLUB.

There is a National Mouse Club in Britain with an Annual Show at which House Mice of all sorts of colours are shown for prizes. There are many women competitors who treat these variegated House Mice as pets, stroking and fondling them. Truly a changed psychology from the day when a mouse could frighten a woman into a fit.

SINGING MICE.

House Mice have been described as silent, though when alarmed they emit a shrill squeak. But many people have heard the House Mouse "sing," sometimes as a solo performer, sometimes in chorus. The songsters are of both sexes, so the song is not the "love-song" of the male as, for example, in birds and many insects. The "song," which may be kept up for some time, is not unpleasant, and in some cases has suggested the trilling of a "weak-voiced canary." One singer was advertised for broadcasting, but at the appointed time refused to sing. Perhaps there are also "temperamental tenors" among mice.

The view has been widely expressed that the "singing" is pathological, due to an inflammation of the bronchi and the larynx. This view is based upon post-mortem examinations of singing mice.

WALTZING MICE.

There is a strain of House Mice—known as Waltzing Mice—with the habit of spinning round in circles. Sometimes small, sometimes wider. They do not chase their tails, for these, as a rule, are held more or less erect. This breed of mice was commoner in Victorian times, when they were children's pets. For a long time they have been bred in Japan. A buck and two does were presented in November 1937 to the London Zoological Garden. The donor, describing what he had seen, says that sometimes several took part at the same time in the "waltz," and that it was a pretty sight to see them going round in one direction, with one in the centre going in the opposite way.

The "waltzing" is said to be due to some anatomical defect of the inner ear. The waltzers are believed to be deaf.

THE LONG-TAILED WOOD MOUSE (*Apodemus sylvaticus*).

This mouse, common in England, Scotland, and Ireland, is not a house mouse, nor markedly a stack-dweller, though it can be found in stacks. It is more a frequenter of woods, hedgerows, cornfields, nurseries, gardens, and market-gardens. It can be confused with the last species (*Mus musculus*), but it has longer ears, eyes markedly prominent, and the feet larger and narrower; and the female has only six teats.

The colour above is red-brown, the chest and the under-fur are creamy.

This mouse makes a burrow which leads to a storehouse, from which passages lead to bolt-holes. But sometimes the shelter-place is not underground, and this mouse, being a good climber, may make use of the deserted nest of a bird. The Wood Mouse is a great storer and yet it does not truly hibernate.

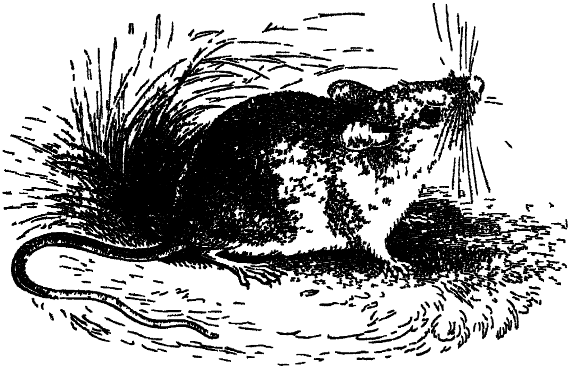

Fig. 22.—*The Long-tailed Wood Mouse.*

From 'Birds and Beasts as Farm Pests,' by Professor James Ritchie
By the courtesy of Oliver & Boyd.

The Wood Mouse is a quick breeder; a litter in three weeks or just over, and three, four, or five to a litter.

The food consists of grain, seeds, bulbs, the corms of the crocus, peas, beans, nuts. Being a good climber it also takes hips, haws, and other fruits. Troublesome in the garden, it is also destructive in cornfields and to the seeds of useful forest trees. It does some good by taking insects.

THE HARVEST MOUSE (*Micromys minutus*).

This little mouse cannot be regarded as a pest. It is found in England and Scotland; it may be described as rare in Scotland, and only locally common in England. Except the Lesser or Pigmy Shrew, the Harvest Mouse is the smallest British mammal; its body is $2\frac{1}{2}$ inches long and its tail 2 inches. The back and flanks are yellow-brown and the under-parts white.

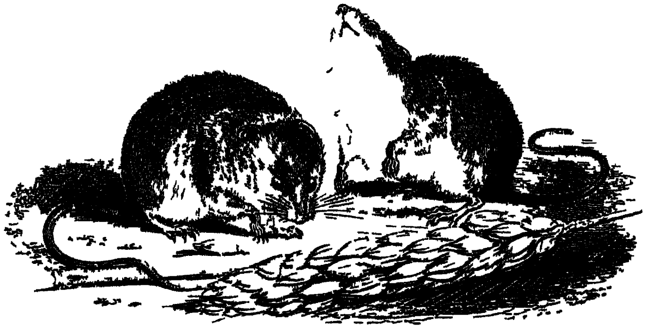

Fig. 23 —*The Harvest Mouse.*

From 'Birds and Beasts as Farm Pests,' by Professor James Ritchie

By the courtesy of Oliver & Boyd.

An interesting feature is its prehensile tail, by means of which it climbs corn and the stems of roadside plants.

The food consists of seeds and shoots, but it is also insectivorous. The nest, which is above ground, is the size of a cricket-ball, and is made of the woven-together upper leaves of corn-blades and other leaves; the nest is also found among the tangled growth of wild plants along the sides of fields.

INSECT AND OTHER PESTS OF 1937.

By A. E. CAMERON, M.A., D.Sc., F.R.S.E.,
Consulting Zoologist to the Society.

The outstanding entomological events in Scotland in 1937 included an intense outbreak of the Antler Moth (*Charæas graminis*) in the central and southern uplands, an increased degree of infestation of the Sheep Tick (*Ixodes ricinus*) in various hill districts, a continuance of the destructive activities of the Heather Beetle (*Lochmæa suturalis*), and local damage to barley and oats by the caterpillar of the Common Rustic Moth (*Apamea secalis*). The following insects were also reported as injurious: the Rosy Rustic Moth or Potato Stem Borer (*Hydrœcia micacea*), the Vapourer Moth (*Orgyia antiqua*) attacking heather, the Wine Cork Moth (*Borkhausenia pseudospretella*), the Furniture Beetle (*Anobium striatum*), the Store Beetle (*Ptinus tectus*), the Buddleia Beetle (*Cionus scrophulariæ*), the Hill Pasture Beetle (*Dascillus cervinus*), the Dock Sawfly (*Ametastegia glabratu*), the Chrysanthemum Stem Fly (*Psila nigricornis*). In certain districts Wireworms were destructive to cereals, and the Root Eelworm proved injurious to potatoes in allotments and fields in Midlothian.

During the past four years slugs injurious to the potato crop in South-East Scotland have been investigated first by Dr Robert Carrick (now of Leeds University), and latterly by Mr J. E. Esslemont. The work has been done in my laboratory and also on local farms. A brief account of the investigations, which have formed the subject of papers elsewhere by the two workers, is appended to this article.

I am indebted to Mr J. W. M'Hardy for the photographs from which Figs. 25, 26. 38, 40, and 41 have been reproduced.

THE ANTLER MOTH (*Charæas graminis*).

Periodicity of Outbreaks.—In different parts of Britain and often at long intervals the Antler Moth, a native of upland pastures of elevations of 700 feet and more, forces itself on the attention of sheep farmers and the general public by inordinate increases of its numbers, which often involve areas of several square miles. The periodicity of these outbreaks, as may be judged by the following records taken from Hardy,[1] Service,[2] Cole and Imms,[3] and Fryer,[4] is quite irregular: 1762, Selkirk and Peebles; 1765, Dumfries and Roxburgh; 1802, Selkirk and Peebles; 1812, Dumfries; 1824, Dumfries and Skiddaw; 1826, Dumfries; 1827, Skiddaw; 1830-36, South-West Scotland; 1881, Lancashire and Derbyshire; 1884, Glamorgan; 1885, Selkirk, Peebles, and South-West Scotland; 1886, South-West Scotland; 1894-95, Selkirk and South-West Scotland; 1910, Glamorgan; 1917, Derbyshire and Yorkshire to Westmorland; 1935, Wales (Brecon); 1936, Brecon Beacons and Cader Idris, North-West England; 1937, Cader Idris, North-West England, and Scotland.

The factors which determine the occurrence and the irregularity of the outbreaks are not known. Both Hardy and Cole and Imms comment upon the fact that the outbreaks they observed coincided with the late persistence of snow on high ground, which served, according to the latter, to protect the young caterpillars from attacks of insectivorous birds. In the light of Fryer's[5] demonstration, which I have been able to corroborate in the field,[6] that the eggs remain dormant until April, this argument has been weakened. If the alternative suggestion of Cole and Imms that the Derbyshire outbreak of 1917 was due to neglect to burn hill-pastures during the period of the Great War had a general application, outbreaks would probably be more frequent than they are. The burning of upland grazings in Scotland is more honoured in the breach than in the observance.

Intensity of 1937 *Scottish Outbreak.*—The first report of the Antler Moth was made on 16th June at the Stand of the East of Scotland College of Agriculture during the course of the Highland and Agricultural Society Show held at Alloa. It came from Mr J. M. Calvert Wilson, Biology Master, Dollar Academy, and had reference to a mass infestation of caterpillars on the farm of Mr Cullens at Dollarbank and of Mr J. E. Kerr at Harviestoun, both in the Ochil Hills. On examination, the Ochil infestation was found to extend east to west from Glen Devon to Sherriffmuir, and north to south from Blackford to Dollar, involving about thirty square miles. Affected pastures lay at an elevation of 700 to 1800 feet. Another report was received on the same day from Mr James Adam, Muirmill, Denny, Stirlingshire, where the infestation was said to cover an area of nine square miles on the Kilsyth Hills of the Campsie Fells at a height of 700 to 1400 feet. The caterpillars were also observed on the adjacent Fintry Hills. An isolated outbreak was reported from the neighbourhood of Luss, Loch Lomond, Dumbartonshire, and two from Nithsdale, Dumfriesshire, at Sanquhar and Penpont. From Broad Law, Peeblesshire, word of an infestation of large proportions was brought by Mr V. D. Thorburn, Hearthstanes, Tweedsmuir, where the caterpillars were said to have occurred up to 2000-2250 feet. Still another report stated that the caterpillars were present in their countless millions at the sheep farm of Dunside, four miles south of New Cumnock, southern Ayrshire, and large areas in Kirkcudbrightshire were also said to be severely attacked.

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[1] Hardy, J., 1885. "The History of *Charæas graminis*, the Grass or Antler Moth, on the Borders." Berwickshire Naturalists' Club, Vol. XI., p. 195.

[2] Service, R., 1894. "*Charæas graminis* in Southern Scotland." The Entomologist, Vol. XXVII., pp. 278-282.

[3] Cole, A. C., and Imms, A. D., 1917-18. "Report on an Infestation of Larvæ of the Antler Moth (*Charæas graminis*, L.) in the Peak District." Jour. Board Agric., Vol. XXIV., pp. 514-522.

[4] Fryer, J. C. F., 1937. "Recent Caterpillar Plagues in Great Britain." Nature, Vol. CXL., No. 3533, Jy. 17, pp. 94-95.

[5] Fryer, J. C. F., 1919. "Notes on *Charæas graminis*." Ann. App. Biol., Vol. VI., Nos. 2 and 3, p. 207.

[6] About five hundred fertile eggs were obtained in July 1937 from female Antler Moths reared in captivity. Twenty eggs were placed in an incubator at 20° C. Only one hatched; the others died unhatched. The remaining non-incubated eggs were kept, some in the laboratory, the others out-of-doors, and both sets remained dormant until April. Eggs collected from the grass of a hill-pasture on 29th March 1938 began hatching in the laboratory during the first week of April. Many of the eggs were already hatched when found, but whether recently or last year could not be decided. One first-stage caterpillar as yet unfed was recovered from the grass.

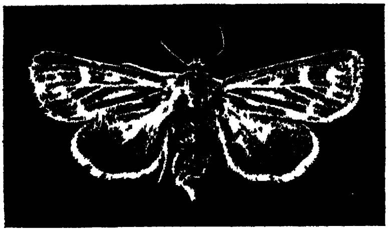

Fig. 24.—Charæas graminis. *Antler Moth. Female*

From nature. Slightly enlarged.

All infested hill-pastures that were examined in June were found to have retained their brown winter appearance. At elevations of 700 feet and upwards there was a marked deficiency of the tender young grass which normally clothes the hills in June. Instead of grazing on the heights sheep had descended to their winter feeding-grounds in the valleys, which were free from caterpillars, with a consequent serious loss of pasturage to flockmasters. On 25th June a visit was made to the Ochil Hills. On Mickle Corum, a hill of about 2000 feet near Sherriffmuir, caterpillars were present from about 900 feet to near the top. In the late afternoon only an odd caterpillar could be observed here and there feeding on the leaves of grasses, while others were creeping over the surface of dead brown patches where the grass had previously been destroyed. Close examination revealed that casual observation gave a wholly inadequate idea of the intensity of the infestation. A square foot of ground was selected at random and submitted to careful analysis, with the result that it yielded thirty-one caterpillars hidden in the surface mat of grasses. Infested pastures on the Campsie Fells and elsewhere proved to be similarly and equally affected. Intense as the infestation proved to be at the end of June, it was realised that in May the density of the less mature caterpillar population would have been very much greater, since in the intervening period various controlling agencies had contrived to obliterate large numbers of the pest. Whilst the actual area of infestation in Scotland could only be roughly guessed, estimates of the extent of local infestation proved enlightening. In the Glendevon region of the Ochil Hills it was considered that ten to fifteen thousand acres were involved, and one farmer reckoned that one-third of his three thousand acres of pasture had been destroyed.

Life-history and Description of the Moth.—The *moth* (Fig. 24), which enjoys a wide distribution in Scotland, is one of the 'owlets' or 'millers' (*Noctuidæ*), the caterpillars of which are known as 'cutworms,' and include some very serious pests of agricultural crops. Unlike many of its relatives of diverse tastes, the Antler Moth has retained what is probably the primitive grass-eating habit of the owlet moths. With a few exceptions it restricts itself to graminaceous food-plants.

Across the outspread fore-wings the Antler Moth measures one and a quarter to one and a half inches, the male being slightly smaller than the female. It is the colour-pattern of these same fore-wings which readily serves to distinguish the moth from other kinds of owlet. Each possesses a prominent pale streak with pointed branches that recall the tines of a stag's antlers. Hence the moth has not inappropriately earned its qualification of 'Antler.' For the rest the ground colour of the fore-wings varies through different shades of dull grey to reddish-brown. The hind-wings are a grey colour which deepens to brown at the margin.

In habit the moth is diurnal as well as nocturnal. In July and August it is often encountered during the day on moorland hovering over heather and grass, or settled on the flowers of weeds such as ragwort and thistles. At night it readily enters rooms through open windows, attracted there by the light. For several nights during the first two weeks of August 1937 the Antler Moth was the one and only kind of owlet moth which I captured in large numbers in the lighted room of a house at Auchenlay, Dunblane, about four miles due west of a site at Harperstone in the Ochil Hills, which had been heavily infested by the caterpillars in

June. Incidentally, one learned from these captures that, whilst infestations of the caterpillars are confined to high ground of 700 feet and upwards, the moths may occur at the comparatively low elevation of 250 feet or less.

The *egg* is an oblate spheroid, flat below and rounded above, about $\frac{1}{32}$nd of an inch in diameter, white with a slight pearly iridescence, the surface ornamented with a delicate netted pattern.

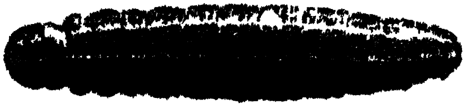

Fig. 25.—Charæas graminis. *Full-grown Caterpillar, upper side,* × 2.
From nature.

The female moth whilst in flight drops the eggs at random among grass during August. Throughout the winter they remain dormant and hatch in April or May. The period of incubation is thus one of about eight months.

The *caterpillar* (Fig. 25) measures about $1\frac{1}{4}$ inches long by $\frac{1}{4}$-inch broad when full grown. Its colour varies from greenish to bronzy-brown and there are three narrow longitudinal yellowish stripes along each side of the body and a similar unpaired stripe down the middle of the back. The hairless skin is finely cross-wrinkled; the under surface of the body is lighter than the upper, and the head is dark brown. Each of the first three body rings bears a pair of short, jointed, walking legs, and there are five pairs of stump-like unjointed legs on the hind body.

Fig. 26.—Charæas graminis. *Chrysalis,* × 2.
From nature.

When the caterpillar has completed its feeding it seeks a place in which to pupate. Usually it burrows beneath the surface for about an inch and pupates sometimes in soil, but more usually at the bottom of grasses, among sphagnum moss or even under stones and in the crevices of fell dykes. After a brief rest the caterpillar sloughs its skin, and there then appears the orange-brown *chrysalis* (Fig. 26), about $\frac{5}{8}$ths of an inch in length, which gradually darkens to a deep mahogany colour. After a lapse of three or four weeks the moths emerge, the first appearing in July from the first-formed chrysalids.

Food of the Caterpillars.—The plants attacked by the caterpillars are generally those of poor quality. According to Service (1891) they include moor-mat grass (*Nardus stricta*), tufted hair-grass (*Aira cæspitosa*), brown-top bent (*Agrostis vulgaris*), molinia (*Molinia cœrulea*), rough-stalked meadow grass (*Poa trivialis*), also deer grass (*Scirpus cæspitosus*), jointed rush (*Juncus articulatus*), heath rush (*Juncus squarrosus*). Others that have been recorded are sheep's fescue (*Festuca ovina*), creeping bent grass (*Agrostis alba*), Yorkshire fog (*Holcus lanatus*), cotton grass (*Eriophorum vaginatum*), field rush (*Luzula campestris*), carnation grass (*Carex* sp.). The initial attack of the caterpillars must coincide closely with the early sprouting of the grasses and other food-plants. It must at least occur before the fresh spring shoots have succeeded in overtopping the dead leaves of the previous year's growth, and so thorough are the larvæ in their feeding that the summer is well advanced before affected pastures begin to show signs of recovery and resume their normal green colour. Fears are often expressed during periods of infestation that the caterpillars in their wanderings may descend to the richer meadows and hayfields of the valleys and there create destruction. Actually they have only been known to do so where low-ground meadows have been neglected and invaded by inferior grasses such as moor-mat grass and others that are attractive to the pest.

Statements that the caterpillars attack and destroy the roots of grasses must be discounted. Like the majority of cutworms they trim their food-plants at ground level. Hidden as they are in the mat of dead surface grass they are rarely observed engaged at their work of destruction. Again, it has been argued that their activities are not altogether an unmixed evil, since it is only inferior kinds of grass which they destroy, and so they may be said to perform a service in improving a pasture similar to that provided by burning. The comparison is not strictly an apt one, since a fire can accomplish what caterpillars cannot do, and that is eliminate the mat of dead brown grass which accumulates on upland grazings as a result of the annual dying-back of the grass. Such dead grass has no grazing value for sheep, and is left untouched by the caterpillar of the Antler Moth.

Wandering Habit of the Caterpillar.—Observation of the infestations on the Ochil Hills and Campsie Fells in the third week of June showed that the wandering of the caterpillars could not be strictly designated a migration. In the first place, the caterpillars on the move did not appear to follow any determinate direction, and, in the second place, they did not seem to achieve any particular aim or object in their processionary travels. They proceeded variously up, down, or across an infested hill, and often were found to traverse green grassy areas without stopping to feed. This latter behaviour, combined with the fact that the members of the wandering bands were full-grown caterpillars or nearly so, appeared to indicate that their restless activity was probably an expression of their search for suitable quarters in which to pupate. Certainly the wandering instinct is not characteristic of the caterpillars in their early feeding stages, and this explains why an infestation usually goes unnoticed by shepherds and flockmasters until the caterpillars are full-grown. The damage is then almost complete, and it is too late to undertake measures of control.

It was noted that the caterpillars were sluggish when they were feeding. On being disturbed they displayed a curious trick of rolling rapidly and restlessly in a small space, and they also smartly bent their bodies alternatively right and left, bringing the head and tail into contact now on one side, now on the other.

Sequel to the Wandering Habit of the Caterpillars.—In view of the varied potential mishaps that beset the path of the wandering caterpillars, the Antler Moth would appear to derive little if any biological advantage from its intense wanderlust. Rather is the contrary the case, for the most conspicuous result of their restlessness is an extraordinary depletion of their numbers from adverse causes that will presently be described. Whatever significance we may attach to this depletion, there can be no doubt that it is ultimately favourable to the species by relieving the tense competition for food and space—always acute in a prolific species. There is, too, a lessened risk of the annual repetition of serious outbreaks in any single locality. Occasionally such repetition does occur, as witness the series of outbreaks that was recorded in the South-West of Scotland between the years 1830 and 1836, and again in 1894 and 1895 in the same region.

No description of an infestation of the Antler Moth would be complete that did not include comment upon the striking losses of countless numbers of the caterpillars in hill streams, springs, ponds, ditches, and drains. Their march to destruction continues unstayed over the brink into the water, from which escape is only possible if the water is shallow. Straight-sided ditches and drains, even if dry, present insuperable difficulties to escape. The attempts of the trapped caterpillars to climb the steep walls result in failure, and they are ultimately swept away by heavy rains which fill the drains.

Perhaps no better index of the intensity of an infestation can be obtained than by examination of the streams of an affected hill-pasture during the latter half of June and beginning of July. Caterpillars that have accidentally dropped into the water in their wandering are carried down-stream until they are swirled out of the current in a quiet backwater. There they sink and are added to the mass of drowned individuals (Fig. 27) which have preceded them. These masses vary in extent with the size of the backwater. One of about three-quarters of a cubic foot was estimated to contain about 20,000 caterpillars. Similar masses usually of much larger

Fig 27.—Charæas graminis. *Caterpillars of Antler Moth.*

From nature. Reduced The caterpillars are massed in the backwater of a hill stream, into which they have fallen and been drowned.

By courtesy of "Star Photos, Perth"

extent, varying in depth from a few inches to a foot or more, were distributed at short intervals all along the course of the stream. The odour rising through the water from their decaying bodies was quite appreciable in the heat of the day.

Stone Dykes as Barriers.—The loose rubble dykes that serve as the boundaries of upland pastures present to the caterpillars an obstacle which they do not readily surmount. In their wanderings many caterpillars arrive at the base of these dykes and travel on the ground along their length. Some climb the stones and may succeed in penetrating to the other side, provided the crevices which they traverse transmit the light and there are no pitfalls. Dark crevices, on the other hand, repel the caterpillars. Even those that are successful in gaining the other side of the wall do not distribute themselves to the neighbouring pasture, but remain hugging the dyke.

Causes of Outbreaks.—The causes of outbreaks may not always be immediate. Usually they are to be sought in conditions which prevailed some time previous to the actual onset of an infestation. Of the various factors which exert control on an insect, climate and natural enemies are most important. Primarily the extent of an infestation of Antler Moth caterpillars depends on the density of the moth population during the previous summer and the size of the area over which the eggs were laid. Whilst the number of eggs laid is important, it is not necessarily a criterion of the density of the future caterpillar population, which will depend on the kind of weather experienced by the hibernating eggs, and also the activities of predatory birds and insects attacking the young larvæ in the spring.

The eggs are comparatively thin shelled, and in the laboratory are readily susceptible to injury by desiccation and by moulds. A batch of eggs kept dry in a glass dish at 20° C. was dead after six weeks. Others that were kept moist under the same conditions of temperature succumbed to mould. It is not unlikely that desiccation and mould account for many eggs in the field. For the sake of comparison eggs of the Vapourer Moth (*Orgyia antiqua*) were subjected to the same treatment in the laboratory as those of the Antler Moth; they remained unaffected by either desiccation or mould throughout the winter, and at 25° C. hatched in January.

Some authors, including Hardy, Cole and Imms, have remarked how infestations are sometimes preceded by the late persistence of snow on the hills in spring and early summer. The former, too, believed that outbreaks were somehow associated with continued drought. The occurrence of infestations soon after epidemics of Field Voles is probably a chance coincidence, both being favoured by the same kind of climatic conditions.

Natural Control. (1) *Birds.*—The value of the control exerted by birds on the caterpillars of the Antler Moth cannot be overestimated. Large flocks of sea-gulls soon begin to gather on infested hillsides, and their unaccustomed presence is frequently the first warning that there is something amiss. Among birds that have been recorded as devouring the caterpillars are the black-headed and common gulls, the starling, rook, curlew, lapwing, and golden plover. On the Ochil Hills and Campsie Fells gulls and starlings were most assiduous in destroying the caterpillars, and they were likewise the most numerous. From early morning till late afternoon the gulls quartered the infested hillsides. When disturbed they rose wheeling overhead in such large numbers that the air seemed literally alive with birds uttering their piercing cries as they continued to mount higher and higher.

The thoroughness with which gulls and starlings apply themselves to the task of finding the insects is indicated by the tufts of sphagnum moss scattered everywhere about and detached by the birds in their eager quest for the caterpillars and chrysalids hidden beneath the surface. This disturbance of the moss was very apparent in some infested localities during June and July.

Rooks, curlews, and lapwings were comparatively few in number, and I did not observe them preying upon the caterpillars. Some farmers, however, reported that they were occasionally observed feeding on the caterpillars. Golden plovers were observed at Harperstone in the Ochil Hills on the afternoon of 25th June, but they occurred on the moor far below the infested area, which was then occupied by the marauding sea-gulls.

An interesting record of snow-buntings having fed on the caterpillars of the Antler Moth was published by Service (*loc. cit.*) in 1894. The author reported that in the stomachs of eight snow-buntings shot on Crawfordmuir in January an average of eight or nine undigested skins of the larvæ of the Antler Moth was found. This discovery, however, would appear to require verification, especially in view of the result of the experiment made by Fryer (*loc. cit.*) in 1919 and our observations, 1938 (*vide* p. 95), which demonstrate that the Antler Moth hibernates in the egg-stage.

(2) *Insect Parasites.*—In Italy, according to Smith,[1] who quotes Leonardi, five different kinds of Ichneumon flies have

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[1] Smith, K. M., 1931. 'A Textbook of Agricultural Entomology.' Cambridge, p. 84.

been reared from the Antler Moth, and one species has been recorded as a parasite in Sweden. Since there were apparently no records of any species of parasitic insect having been reared from the Antler Moth in Britain, I collected a large number of its caterpillars and chrysalids on the Ochil and Kilsyth Hills in June and July. One hundred and fifty of these were chosen at random and placed in a breeding cage. During July and August there emerged from each of twenty-one chrysalids a single specimen of *Ichneumon gradarius*, Wesm. The percentage parasitised was thus fourteen. The remaining chrysalids produced moths of which the sexes were almost evenly divided, whilst those of the parasite were in the ratio of four females to three males. The parasite was kindly identified by Mr J. F. Perkins, Department of Entomology, British Museum (Natural History), London, who advised me that it has been bred from the Antler Moth in many countries. He was not, however, aware whether it had been actually recorded from the Antler Moth in this country. It is interesting to learn that Morley,[1] in a footnote appended to his description of *I. extensorius*, remarks that *I. gradarius* is said to be parasitic upon *Panolis piniperda* and *Charæas graminis*. His capture of *I. gradarius* on the flowers of *Angelica sylvestris* in Suffolk was the first record of its occurrence in Britain, but there is nothing to show that it was actually reared, either here or in a recent paper by Morley and Rait-Smith.[2]

Artificial Control.—Among the *remedial* measures that have been recommended there are included trenching infested pastures, broadcasting of arsenical poison baits, and spraying a strip of pasture ahead of the caterpillars with a wet arsenical insecticide or a coal-tar oil in order to create a barrier against their spread. Unfortunately, the efficacy of these methods is usually greatly handicapped by the advanced condition of the infestation before its existence is even realised. In such circumstances the undertaking of special means of control would be a sheer waste of expense, especially where an outbreak has reached the zenith of its intensity, and the caterpillars have pupated or are preparing to pupate. At the same time, history has shown that even in the absence of artificial control infestations may not be repeated for several years.

Judging from the masses of caterpillars trapped in open drains there can be no doubt that trenches would perform a useful function. They should be at least 14 inches deep and straight-sided. Since there is a certain degree of risk for sheep and game attached to the application of arsenical insecticides to pastures, serious objections are raised to their adoption. Further, the uniform distribution of poison baits on hill-pastures would present difficulties, and tufted bents are not suitable for retaining the spray of a wet arsenical insecticide.

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[1] Morley, C., 1903. 'British Ichneumons.' London, Vol. I., p. 135.

[2] Morley, C., and Rait-Smith, W., 1933. "The Hymenopterous Parasites of the British Lepidoptera." Trans. Roy. Ent. Soc., Lond., Vol. LXXXI., Pt. II., p. 148.

In the long-run *preventive* measures are likely to be more valuable than remedial. Periodical burning of hill-pastures in the late autumn would get rid of the accumulation of dead bents, which would then be replaced by tender young shoots in the spring; the burning would also destroy the eggs of the Antler Moth scattered among the grass.

THE COMMON RUSTIC MOTH (*Apamea secalis*).

The damage due to the caterpillar of the Common Rustic Moth is either increasing in amount or is being more frequently noticed. Petherbridge and Thomas [1] have recently found it causing injury to winter wheat and barley in Norfolk and Suffolk, and quote previous instances of its destructive activities in wheat, oats, and rye in certain of the southern and midland English Counties. Likewise, Barnes and Mercer [2] have shown that it damages the heads of meadow foxtail and other grasses in Northern Ireland and Harpenden, Herts., in a manner not unlike that of the larvæ of *Amaurosoma flavipes* and *A. armillatum* on the heads of timothy grass.

Distribution.—The moth occurs throughout Great Britain and Ireland, and on the Continent it has been recorded as a pest throughout the northern countries.

Food Plants.—These include barley, oats, rye, and wheat, and certain grasses of which meadow foxtail, fescue, and cocksfoot are important.

Life-history.—The *moth* (Fig. 28) has a wing-spread of about 1¼ inches, and is very variable in colour. The fore-wings may be brownish-yellow, reddish-brown, or dark brown with a dark central band. The orbicular or circular mark is indistinct, but the reniform or kidney-shaped mark is more or less white. The hind-wings are a smoky-brown.

There is only one generation per year, and the moths are on the wing from July until September.

Oviposition has not been observed in Britain, but Barnes and Mercer suggest that the eggs may be laid within the sheath of the flowering shoot. Shtchegolev, quoted by the same authors, is said to have discovered the eggs at the beginning of September arranged in chains near the leaf-sheaths; in captivity the period of incubation was said to have been one week.

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[1] Petherbridge, F. R., and Thomas, I., 1936. "The Common Rustic Moth, *Apamea* (*Hadena*) *secalis* L., attacking Winter Cereals." Ann. App. Biol., Vol. XXIII., pp. 649-652.

[2] Barnes, H. F., and Mercer, S. P., 1936. "Damage to panicles of *Alopecurus pratensis* L. by *Apamea secalis* L." Ann. App. Biol., Vol. XXIII., pp. 653-657.

Caterpillar.—When full grown the caterpillar[1] measures about $\frac{7}{8}$ths of an inch in length, and is finely wrinkled transversely. In colour it is pale green with two purplish-red longitudinal bands on either side of the green middle stripe of the back. The head is light glossy brown, and so, too, are the plates on the upper side of the first and last rings of the body. The spiracles are white and conspicuously outlined with black. The caterpillar stage, which occurs in the stems of the host plants, lasts from September until May.

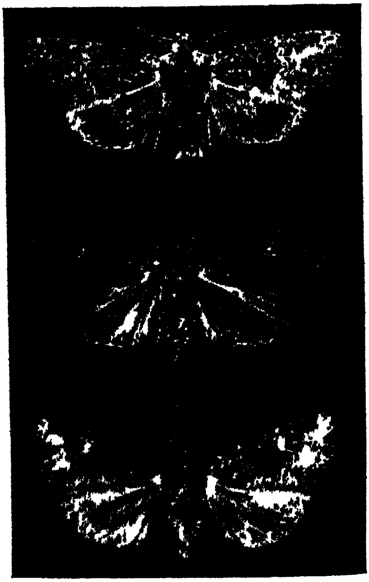

Fig. 28.—Apamea secalis. *Common Rustic Moth.*

From nature. Slightly enlarged Note the variation in colour.

It should be noted that the caterpillar of the closely related Rustic Shoulder Knot (*Apamea basilinea*),[2] with habits similar to those of the Common Rustic Moth, is distinguished from the latter by the possession of a row of oblique black dots on either side of the body, there being two above each spiracle on segments 3 to 12. They are well shown in Buckler's figures of the caterpillar of *A. basilinea* on Plate LXVII. of the volume quoted above. MacDougall, in the paper here quoted, gave a good account of the damage caused by *A. basilinea* at Inveresk in 1910 and 1911.

Pupa.—This stage is said to last for three or four weeks, and occurs in the soil during June and July. It is reddish-brown in colour.

Damage.—Affected plants contain each a single caterpillar, which first destroys the central shoot by eating the base and later the ensheathing leaves. The plant appears limp, the leaves flag and soon wither. Close examination may reveal the caterpillar responsible for the damage hidden away at the bottom of the shoot, which is readily detached. Frequently the caterpillar is missing, having migrated to an adjacent plant, where it repeats the damage. Thus the injury becomes progressively greater as time passes. In a field of barley which was examined in East Lothian on 16th May it was estimated that 10 per cent of the crop had been destroyed. Such a loss is far from insignificant, but is relatively slight compared to that reported by Petherbridge and Thomas in a field of winter wheat in West Norfolk, where in February 1934 only 10 per cent of the crop remained undamaged. The field was almost bare.

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[1] Buckler, D., 1890. "Larvæ of British Butterflies and Moths." Ray Society. London. Vol. IV., p. 98.

[2] MacDougall, R. S., 1929. "Insect Pests, No. VI. Moths." Scot. Jour. Agric., Vol. XII., p. 417

Explanation of the attacks of the Common Rustic Moth is to be found, not in the conditions of the field in the year in which they develop, but in those that prevailed during the previous year at the time the female moths are engaged in laying their eggs. Normally a lea or a hayfield would be chosen for egg-laying, where the regular food-plants of the caterpillar, such as meadow foxtail and cocksfoot, are found. Since it was the experience of Petherbridge and Thomas that attacks occurred in fields of wheat planted after a lea, it was suggested that the eggs were laid there before ploughing and that the caterpillars fed on the grasses before infesting the wheat. This opinion was supported by events in East Lothian where damage was found to occur in fields of barley and oats that had followed after a lea or hay. There were cases, however, where damage was found to have developed in a cereal crop following one of the same or another kind which had been sown along with grass as a catch-crop. There was a single instance of an attack in a barley crop following swedes. The chances are that the latter contained weeds attractive to the moths for oviposition.

Attacks are usually associated with light soils and loose tilth. Such conditions facilitate the passage of the caterpillars from plant to plant. In some localities, too, according to Petherbridge and Thomas, attacks on cereal crops are associated with their proximity to grassland, which is the normal breeding-place of the moth.

Control. 1. *Natural.*—Two species of Ichneumonid fly were reared from *A. secalis*. Ten caterpillars were collected from oats and barley in the field in May and June, and were placed in a cage planted with barley in the laboratory. From each of four of the caterpillars there emerged at the beginning of July a single parasitic larva which spun in the soil a reddish-brown, cylindrical cocoon about ½-inch long and ⅛-inch broad. In August two of the cocoons yielded respectively a male *Lissonota cylindrator*, Vill., and a female *Lissonota* *sulphurifera*, Grav. The specimens were identified by Mr J. F. Perkins of the Department of Entomology, British Museum (Natural History), London, for whose assistance I am indebted.

So far as *L. cylindrator* is concerned, Morley [1] (p. 205) says that it is very common in Britain during July and August on the flowers of *Umbelliferæ*. It is often collected, too, by sweeping herbage, oats, bracken, water-weeds, and reeds, and the males are found at the roots of grass. According to Morley (*loc. cit.*) the parasite has been reared from the owlet moth *Arenostola* (*Tapinostola*) *elymi* in Germany, and from *Ægeria* (*Synanthedon*) *culiciformis* in Britain. It has not apparently been previously recorded from *Apamea secalis*.

The habits of *L. sulphurifera* are like those of *L. cylindrator*. From August to mid-October it occurs on umbelliferous flowers and herbage, and has frequently been recorded in England. According to Morley (p. 207) it has been reared from the larvæ of *Ægeria scoliæformis*, *Triphæna fimbria*, and *Oligia literosa* in Britain. There do not appear to be any previous Scottish records of *L. sulphurifera*, and its occurrence as a parasite of *A. secalis* is here recorded for the first time.

2. *Artificial.*—From what we have learned of the habits of *A. secalis* it is evident that its attacks on cereals are encouraged by the grasses of a preceding lea or field of hay. It is thus advisable that a rotation should be so planned that cereals do not follow immediately on grass.

Bran poison baits are commonly employed in the control of surface cutworms. They are composed of 20 lb. of bran, 1 lb. of Paris green, ½-pint of treacle or molasses, and water sufficient to make the mixture friable and easy to broadcast. Whether a poison bait would be effective against *A. secalis* would depend upon whether the caterpillar comes to the surface or whether it burrows underground in passing from one plant to another. It is my opinion that the status of *A. secalis* as a pest, its habits, and life-history are so inadequately known that they would well repay investigation.

THE ROSY RUSTIC MOTH (*Hydrœcia micacea*).

Like the Common Rustic, the Rosy Rustic Moth is a member of the important family of Noctuid or owlet moths, and, whilst the larva of the former bores into the stems of graminaceous plants, the latter prefers plants with stouter stems in which to tunnel.

Distribution.—*H. micacea* is a northern species which occurs throughout Great Britain and Ireland, and is spread over North and Central Europe.

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[1] Morley, C., 1908. 'British Ichneumons.' London Vol. III.

Food Plants.—The wild host plants of the Rosy Rustic Moth include the dock, plantain, valerian, couch-grass, and sedges. Among cultivated plants it has been recorded from the potato, tomato, sugar-beet, rhubarb, onion, and hops. MacDougall (*loc. cit.*) has also recorded it as injurious to hollyhock. In Britain *H. micacea* has assumed considerable economic importance because of its habit of boring into the stem of the potato plant, whence the larva has been appropriately named the Potato Stem Borer.

Life-history.—The *moth* (Fig. 29) is on the wing during August and September, flying at dusk and readily attracted by sweet baits and light. The fore-wings have a rosy hue which is interrupted at the outer margin by a grey band. By contrast the hind-wings are grey relieved by a narrow dark line across the middle. From tip to tip of outspread wings the moth measures 1 to 1½ inches.

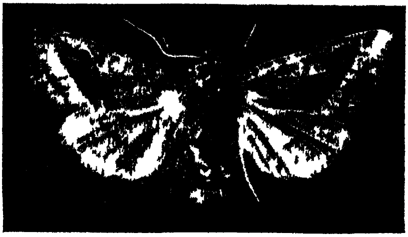

Fig. 29.—Hydrœcia micacea. *Rosy Rustic Moth.*

From nature. Slightly enlarged.

The *eggs* are said to be deposited during autumn on the lower leaves of the host plants, and they hatch during the same season.

The *caterpillar*, described by Buckler (*loc. cit.*, p. 51), spends the winter as an immature larva in the soil, and becomes active in the spring and early summer, when it tunnels into the stems of its host plants. By July it is full-grown, and then measures about 1⅜ inches. The upper side of its body is suffused with pink and the under side is pale. Along either side there is a series of dark-brown spots, each of which carries a bristle. At maturity the larva emerges from the stem which it has hollowed and makes a smooth-walled cavity for itself in the earth. Here it transforms to the *chrysalis*, which is of robust build and ends behind in a prominent spike. There are also a few bristles which arise near the hind-end and point backwards. This stage lasts for about five weeks, which brings the cycle of development round to August and the adult moths.

Damage.—Injury to the potato first becomes noticeable in June and is more accentuated in July. At first, affected plants show retardation of growth. The caterpillar enters the haulm near its base and, boring upwards, gradually enlarges its tunnel until the stem is almost completely excavated. As a result, the plant wilts and dies.

Judging from the number of inquiries which were received from growers in the south-east, the insect appeared to be more abundant than usual, not only in fields, but also in gardens and allotments.

Control.—Infested plants should be collected and destroyed along with the contained caterpillars. Natural host plants such as the dock and plantain should be eradicated. In 1937 some of the worst damage was reported from allotments which had been overgrown with weeds the year previous to their being planted with potatoes.

HEATHER CATERPILLARS.

Investigation of the Heather Beetle, to which reference was made in the 'Transactions' of last year, is still proceeding. During the course of examination of moors in various parts of Scotland several kinds of caterpillars that include heather in their dietary have been collected. The following are a few of those that were observed:—

1. *The Vapourer Moth* (Orgyia antiqua).

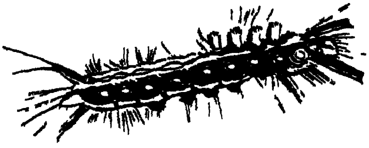

Fig. 30.—Orgyia antiqua. *Caterpillar of the Vapourer Moth.*

From nature. Slightly enlarged

With one exception, that of the Vapourer Moth, the caterpillars proved to be of slight economic importance. Even the Vapourer Moth was so limited in its occurrence as to be merely of local and occasional significance on heather. There are few who are not acquainted with its grey hairy *caterpillar* (Fig. 30), which is found on heather as well as on many other shrubs and trees from May to July. Full grown it measures 1½ inches long, and is conspicuous because of its contrasting colours of black and red, yellow and violet. Down the middle of the back there runs a creamy red-dotted line which is edged with black, and on each side of it there is a series of raised red spots. Along either side there is a yellowish broken line; but more striking than the colour pattern are the ornamental hair-tufts and hair-pencils. On the back there are four yellow, dense, low tufts closely arranged one behind the other and shorn across at a uniform height. Added to these there are two pairs of prominent long pencils of hair, one of which is black and projects forwards from the ring behind the head. The other is directed backwards at the head end and is dark-grey or brownish.

During July and August the mature caterpillar spins up its cocoon amongst the heather, the silk of which is interwoven with hairs shed from its body. The adult *moths* (Fig. 31) appear in September and October, when the dark-grey female, which is no longer than half an inch and provided with the merest vestiges of wings, pairs with the male and sets about the business of egg-laying. The male, it should be noted, has its yellowish-red wings well developed. They spread 1¼ inches, and there is a large white spot at the lower angle of the forewings, which is a good mark of identification.

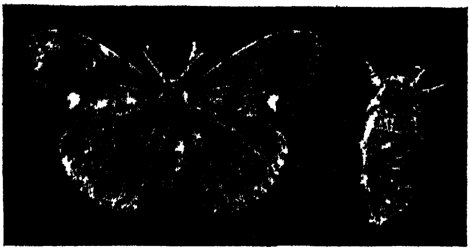

Fig. 31.—Orgyia antiqua. *Vapourer Moth. Male and Female*

From nature. Slightly enlarged.

The pale brownish *eggs* with a darker ring below the depressed top are laid on the outside of the cocoon, and there they remain dormant throughout the winter.

The damage which the caterpillar commits in devouring the leaves of heather is more intensive than extensive. Confined as it is to areas of not more than a few square yards, it can be readily controlled by burning the affected heather either when the caterpillars are feeding or later when they have spun their cocoons.

2. *Northern Eggar* (Lasiocampa quercus *var.* callunæ).

The *caterpillar* (Fig. 32) of this moth measures about 2½ inches when full grown, and is thickly invested with a brown fur. The ground colour of the body is dark smoky-grey, and the divisions between the rings are velvety-black. On each ring there is a triangular orange spot. The markings become more prominent with age and are very distinct by the end of October, when the caterpillar hibernates. On the food-plant it rests in a straight position; when disturbed it falls off and rolls itself into a ring with the head slightly to one side.

The caterpillar, which hatches in June, continues to live through two winters before attaining to full growth, and does not spin its cocoon until the winter of the second year. The oval-shaped cocoon is dark purplish-brown, and is found lying in or near the ground in a flimsy web. Occasionally it is placed on the twigs of the food-plant.

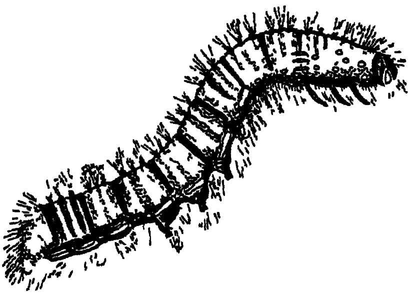

Fig. 32.—Lasiocampa quercus *var.* callunæ. *Northern Eggar. Caterpillar.*

From nature. Natural size.

The *adults* occur on the wing in June. The female is really a handsome insect, with a wing-spread of $3\frac{1}{4}$ inches and about 1 inch long. Its colour is reddish-brown with broad yellow cross-bands on both the fore and hind-wings. The male (Fig. 33) is smaller and darker than the female and has feathered antennæ.

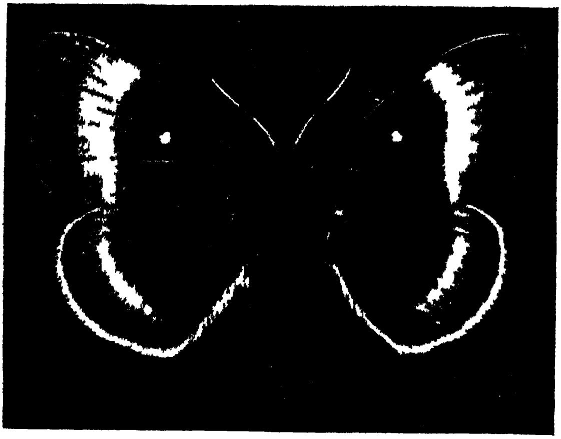

Fig. 33.—Lasiocampa quercus *var.* callunæ. *Northern Eggar. Male.*

From nature. Slightly enlarged.

The *eggs*, which are polished pale brown mottled with darker brown, are said to be deposited whilst the female is on the wing, and therefore they fall to the ground or settle on the herbage over which they are dispersed.

3. *The Fox Moth* (Lasiocampa rubi).

Whereas the Northern Eggar has a life-cycle which extends to about twenty-four months, that of the closely related Fox Moth is completed in twelve months.

The *caterpillar* (Fig. 34) hatches from the egg in June, and it feeds to such good purpose that by October it has increased in length to 2½ inches. The skin of the full-grown caterpillar is velvety-black, but the ground colour is obscured by the dense coat composed of short tawny and long brownish hairs. The head is black and is covered with brownish hair. Feeding continues through August and September, but in October the caterpillar seeks winter quarters. It reappears the following spring, but does not resume feeding. In certain localities and during certain seasons the caterpillars have been observed in vast numbers. In some districts they may be abundant one year and then scarce or absent for several years.

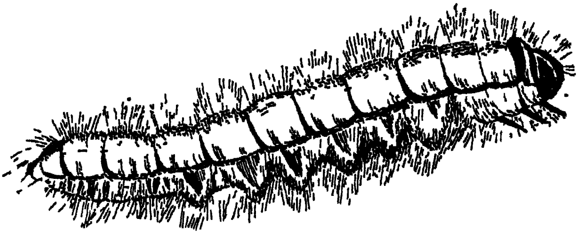

Fig. 34.—Lasiocampa rubi *Fox Moth. Caterpillar*

From nature. Natural size

Fig. 35 — Lasiocampa rubi. *Fox Moth. Male.*

From nature Slightly enlarged

The tawny hairs of the caterpillars readily adhere to the fingers of those who handle living specimens, whence they may be transferred to the face and neck and cause urtication.

The elongated, brown, tubular *cocoon*, made of silk and larval hairs, is spun low down on the food-plant, or at the roots of grass or even in moss, where the round head-end is just discernible above the moss.

The *adults* are on the wing in June, when the male (Fig. 35) may be seen in flight during the afternoon of bright sunny days ; the females, on the other hand, fly only at night. The greyish-brown eggs are laid in June in batches on the stems of plants, including heather.

4. *The Emperor Moth* (Saturnia pavonia).

The feeding period of the caterpillar of that resplendent heather insect, the Emperor Moth, is about three months, June to September. The characters by which the caterpillar can be recognised are readily visible to the naked eye. It is 2½ inches long, and the bright green ground-colour is relieved by segmental black encircling bands, on each of which there is situated a series of rounded yellow or pink knobs bearing short black bristles. Besides heather it is also recorded as feeding on bramble, sallow, and sloe.

The flask-shaped *cocoon* is attached to heather or other low-growing plant. On the inside of its bottle-neck there is an interesting adaptation which guards the opening to the outside. It consists of a row of stiff bristles which converge towards and close the opening. Whilst parasitic insects on the outside find it impossible to force an entrance, the moth on emergence from the chrysalis can readily squeeze its way out. After the escape of the moth the fibres spring back into place and again close the opening of the now empty cocoon.

Of the *adult moths* which are found in May, the male is more showy than the lethargic female, and is withal smaller, with a wing-spread of 2¼ inches against 3¼ inches in the female. The rosy or tawny shades which suffuse the purplish-grey of the male fore-wings is absent in the female, which is thus the less conspicuous. Whilst the male flies during the day, the female becomes active only at night.

The *eggs*, which are olive-brown clouded with grey, are laid in neat batches around the stems or twigs of plants.

5. *The Beautiful Yellow Underwing* (Anarta myrtilli).

The life-history of this Noctuid moth is incompletely known. Of all the caterpillars which feed on heather there is perhaps none that is more successfully camouflaged by the resemblance of its colour pattern to its surroundings than the *larva* of the Beautiful Yellow Underwing. When it is feeding on a leafy heather twig (Fig. 36) it is sometimes very difficult to discern the caterpillar at rest. This is due to the interruption of the heather-green of the body by three dorsal rows of pale yellow bars arranged in such fashion that the pattern resembles that of the leafy twig itself, the bars corresponding to the interstices between the leaves. The caterpillar is found from July to October, when it probably pupates in the ground and remains dormant during the winter. The fact that the caterpillar has occasionally been taken in spring shows that it may also hibernate in this condition.

The *moth*, which has a wing-spread of about an inch, has purplish-brown fore-wings with clearly defined white markings. The hind-wings are orange-yellow with an outer blackish margin. It occurs from May to July, and is active during the day, resting in the evening at the tips of heather twigs.

6. *The True Lover's Knot* (Agrotis strigula).

The *caterpillar* of this Noctuid moth was taken on several occasions on moors during the winter of 1937-1938. It may be found from August to May on heather, and is said to hide by day in the moss or among dead leaves below the food-plant. Like the caterpillar of the Beautiful Yellow Underwing that of the True Lover's Knot is also protectively coloured. It is a reddish-brown with a pale line along the middle of the back, which is edged with dark-brown or blackish marks. There is also a pinkish-white stripe along the sides with a brown edging above. The head is yellowish-brown with darker marks.

The white-marked reddish *moth* is common on heather-clad moorlands throughout the British Islands. It occurs during June and July, flying usually at night, but also occasionally during the day.

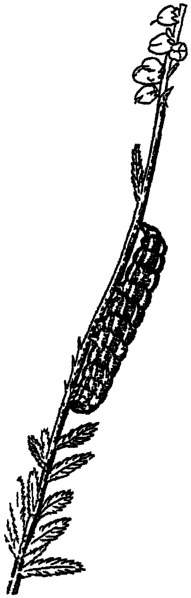

Fig. 36 —Anarta myrtilli. *The Beautiful Yellow Underwing. Caterpillar.*

From nature Natural size

WINE-CORK MOTH (*Borkhausenia pseudospretella*).

There is apparently no end to the variety of insect habits. Nevertheless, there are few who would expect to find an insect seeking its livelihood in the burrows which it has excavated for itself in a wine-steeped cork; and yet this unusual niche must have its peculiar attractions, for more than one kind of tiny moth, all of them members of the large family of the *Tineidæ*, have been found there. The bibulous habits of one of these are actually suggested by its scientific name, *Oinophila v-flava*, the first part of which bears witness to its supposed fondness for wine. Thirty-four years ago Theobald (1904), in his "Second Report on Economic Zoology (British Museum)," referred to the considerable loss by leakage of bottled wines caused by the cork-boring habits of the caterpillar of *O. v-flava*. Some twenty years later Dr R. Stewart MacDougall reported in the 'Transactions' of this Society (1923) a case of ullaging of bottled wines due to a white caterpillar eating its way into the corks. Specimens of the caterpillar were recovered from the dissected corks, and the remains of two dead moths were salvaged, which proved to be *Endrosis lactella* and *Borkhausenia pseudospretella*. As to whether one or other of these moths was identified with the caterpillars was not determined.

Other records of cork-destroying moths are those of Patton,[1] who had indicted two further species of Tineid moths, *Tinea granella* and *T. cloacella*. With the exception of *O. v-flava*, which has a larval habit of making silken galleries in fungus growing on cellar walls, the moths mentioned normally feed in the caterpillar stage on dry cereals and grain in houses and stores. Why they should have changed their diet to the comparatively innutritious substance of cork is difficult to explain, unless the wine absorbed by the latter exerts a specific attraction.

In June 1937 my attention was drawn to damage to the corks of a valuable stock of bottled wine that had been committed by a caterpillar in the cellar of a local wine merchant, and specimens of the latter were identified as *Borkhausenia pseudospretella*. The stocks which were most affected were those of old Burgundy and port, but this discrimination was due not so much to the attraction offered by these particular brands as to defects in the seals of the corks. Those that had been securely sealed with lead-foil were found to be immune from damage, whilst those that had been left unsealed or imperfectly sealed with wax had given the moths the chance of laying their eggs on the exposed cork and the caterpillars had hatched and bored inside.

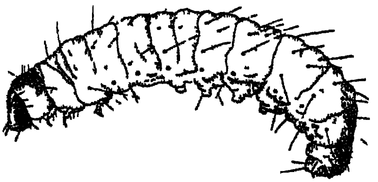

Fig. 37.—Borkhausenia pseudospretella
Caterpillar of Wine-Cork Moth. × 4.
From nature.

An examination of the injured corks showed that they were riddled with galleries filled with particles of frass, and that these extended into the wine-soaked lower end of the cork.

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[1] Patton, W. S., 1931. "Insects, Ticks, Mites and Venomous Animals." Part II.—Public Health. Liverpool.

The *moth* of *B. pseudospretella* has a wing-spread of about ¾-inch. It is found in houses all over the country. The head is light brown. The fore-wings are dark brown with a few scattered golden scales and a few dark spots. The hind-wings are whitish-grey. The *caterpillar* (Fig. 37) is a yellowish-white colour with sparsely distributed long hairs, and has a reddish-brown head. It occurs from June to April.

Control.—From the foregoing it is apparent that fumigation of infested cellars cannot be undertaken because of the risk of contamination of wine in bottles with defective corks. The intent and purpose of fumigation would be to reduce the numbers of the moths which are on the wing from May to September. Better results, however, are likely to be obtained by the practice of protection. In the case under discussion the merchant was advised to rebottle the wine in all bottles having defective corks and to provide seals of moth-proof lead-foil for capping the bottles.

Upland Pasture Beetle (*Dascillus cervinus*).

On 26th January 1937 specimens of a beetle grub were received for identification from Mr John Tullie, Bowanhill, Buccleuch Estates, Hawick, Roxburghshire. The grubs were discovered on the farm of Falnash in an old grass field that was being ploughed and were present in the root layer of the upturned turfs. Their very abundance suggested their potentiality as a noxious pest, and, as the field was to be sown with oats in the spring, there was a natural anxiety lest the crop might be attacked and destroyed by the insect. Specimens of the grub were submitted to Mr A. W. Rymer Roberts, Molteno Institute, University of Cambridge, and to Dr Fritz von Emden, Department of Entomology, Natural History Museum, London, and both authorities agreed that they belonged to the interesting species *Dascillus cervinus*, which I have here named the Upland Pasture Beetle.

Distribution.—According to Fowler[1] (p. 118) the beetle occurs in old pasture in the Solway, Clyde, Tay, Dee, and Moray districts. To these there must now be added Teviotdale. In England it is generally distributed and occurs in the North of Ireland. It is likely to occur wherever there is old grassland at an elevation of about 400 feet.

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[1] Fowler, W. W., 1887-1913. 'The Coleoptera of the British Islands.' London. Vol. IV.

Food Plants.—The larva feeds on the roots of grasses and other plants in old damp pasture. It was recorded by Gahan [1] from near Clondalkin, Ireland, where it was said to be doing injury to grasslands.

Adult.—The beetle (Fig. 38) is about ½-inch long. It is a robust insect of an oblong-oval shape. The male is dark brown and the female yellow. The body is completely clothed with very dense, fine greyish hair. The antennæ are long, thread-like, with the two first joints short and the third very long. The thorax or middle region of the body is broader than it is long. The wing covers are broader than the thorax; their margins are parallel and rounded behind. The legs are stout and feet broad.

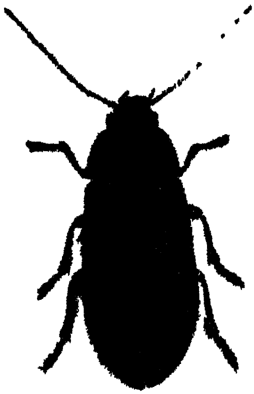

Fig. 38.—Dascillus cervinus. *Upland Pasture Beetle.* × 3.
From nature.

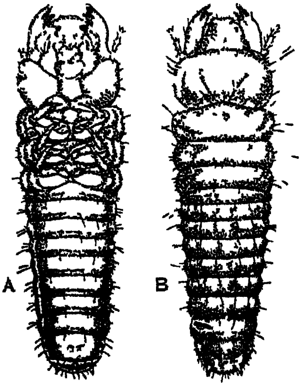

Fig. 39.—Dascillus cervinus. *Upland Pasture Beetle.* × 4.
A, lower and B, upper sides of the larva or grub. *After* Gahan, *Trans. Ent. Soc. Lond.*, 1908.

Beetles reared from larvæ kept in the laboratory emerged during the second week of May. Out-of-doors they occur on flowers early in summer.

Larva.—Full-grown, the larva (Fig. 39) is ⅞-inch long and yellow in colour. The skin of the head and body is uniformly dense in texture and suggests that of a wireworm. The surface is minutely and delicately shagreened. The head, which is almost as broad as the first body segment, is depressed and minus eyes, but has antennæ of four segments. The two mandibles, which are employed in chewing roots of grasses, are powerfully built, broad at the base and tapering to a black

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[1] Gahan, C. J., 1908. "On the larvæ of *Trictenotoma childreni*, Gray, *Melittomma insulare*, Fairmaire, and *Dascillus cervinus*, Linn." Trans. Ent. Soc. Lond.

sharp point. Each has two cutting teeth on its inner side. The body consists of three thoracic and ten abdominal segments, each of which, except the two last segments of the hind body, is about twice as broad as long. Each of the three segments of the thorax bears a pair of well-developed spiny legs attached to the body by a broad basal piece (coxa) and ending in a long curved sharply pointed claw.

The hind body is slightly narrower than the thorax. The first eight segments are all alike, each with a transverse row of long sparse bristles similar to those present on the segments of the thorax. Ninth segment conical with a few unevenly distributed bristles above and its margin fringed with long hairs. A pair of short, pointed tubercles project back from its hind margin, one on each side of the middle. The tenth segment is reduced and overlapped by the enlarged upper part (tergum) of the ninth segment.

On the side of the first segment of the thorax there is a large spiracle on each side, and a pair of minute spiracles on each of the first eight segments of the hind body.

A description of the larva was given by Gahan (*loc. cit.*). His figures, reproduced here, show it to be rather unusually contracted.

Pupa.—In the laboratory the larvæ pupated in a piece of turf on 20th April, and the pupal period lasted for three weeks. The pupa is of the naked type, with limbs and other appendages not cemented down to the surface of the body.

Life-history.—So far as I am aware, the life-history of *D. cervinus* has not been studied in detail. There is evidence that the development may require at least two years, since Mr A. W. Rymer Roberts collected specimens of the larvæ in spring in Westmorland that were decidedly smaller than those which came from Teviotdale in January.

Damage.—The larva is said to be occasionally injurious to damp pasture. Curiously the reverse was the case at Falnash, where the affected pasture lay high, faced south-east, and was so dry that in places the furrow was like powder when turned over by the plough, despite the fall of recent rains. The grass was very poor throughout the field, and where the soil was light and shallow over rock it was replaced by moss. Previous to being ploughed the pasture apparently bore no outward sign of the presence of the grub. The oat crop sown in the spring was not molested, as the grubs had reached their full development and had ceased to feed previous to pupating.

FIELD SLUGS, PESTS OF THE POTATO CROP.

Introduction.—The problem of slugs injurious to potatoes growing in the field has been one that has exercised the minds of Lothian farmers for several years. Annual losses of one to four tons of potatoes per acre have been incurred by individual farmers as a result of slug activity. Naturally losses of such magnitude could not go unheeded, and thus in 1934, as a result of representations made by the farmers concerned, an investigation of the problem was undertaken by the Edinburgh and East of Scotland College of Agriculture. This investigation was made possible by reason of a grant in aid of research made by the Agricultural Research Council through the Department of Agriculture for Scotland, and Mr (now Dr) Robert Carrick, an honours graduate in Zoology, was appointed as investigator. The work was carried out in my laboratory in the Department of Agricultural and Forest Zoology, University of Edinburgh. In 1936 Dr Carrick, on his appointment to another post, resigned his scholarship after completing an exhaustive report which comprised the results of his studies of the life-history and development of the Grey Field Slug and also the habits and control of this and other field slugs. The investigation was not allowed to lapse with Dr Carrick's resignation, but has been continued by Mr J. M. Esslemont, M.A., B.Sc., who has concentrated mainly on the question of slug control in the potato-growing areas of the Lothians. Dr Carrick's work is in process of preparation for publication, and Mr Esslemont[1] has contributed a short paper on the subject of his field experiments and another in collaboration with Mr J. W. Tervet[2] on a fungous infection of slug eggs.

The substance of the following brief account of slugs and their activities is based on the work of Dr Carrick and Mr Esslemont, to whose papers interested readers are referred for further details.

Injurious Potato Slugs.—In the Lothians there occur five species of slugs that are commonly encountered in fields and gardens—namely, (1) the Grey Field Slug (*Agriolimax agrestis*), (2) the Banded Grey Slug (*Arion circumscriptus*), (3) the Dusky Slug (*Arion subfuscus*), (4) the Garden Slug (*Arion hortensis*), and (5) the Hedgehog Slug (*Arion intermedius*). Of these the Grey Field Slug is by far the most abundant, and the one of greatest economic importance. Next to it there is ranged the Banded Grey Slug, which in some localities is only slightly less notorious than is the Grey Field Slug. So far as the potato is concerned the others are of minor significance and will not be further discussed here.

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[1] Esslemont, J. M., 1938. "Observations on the Control of Potato Slugs." Scot. Jour. Agric., Vol. XXI., No. 2, April.

[2] Tervet, J. W., and Esslemont, J. M., 1938. "A Fungous Parasite of the Eggs of the Grey Field Slug." Jour. Quek. Micros. Club.

The Grey Field Slug (Fig. 10) is the mollusc which occurs most commonly in arable land, and, whilst it appears to thrive under agricultural conditions, it is also equally at home in woods, gardens, pastures, moors, and marshes.

Although of a somewhat variable colour, the Grey Field Slug is usually recognised by being uniformly whitish or pale yellow and mottled brown or black. When fully extended the full-grown slug measures 1½ inches. Stretching forward from the head end there are two pairs of black, sensitive and retractile feelers. Over about one-third of the upper surface there extends a fold of skin smoother than the rest, which is known as the mantle or shield and encloses the all-important breathing cavity. The respiratory pore, which can be seen at the edge of the mantle on the right side, is well behind the middle of the latter and is surrounded by a white raised ring. When irritated the Grey Field Slug exudes a large quantity of milky white slime.

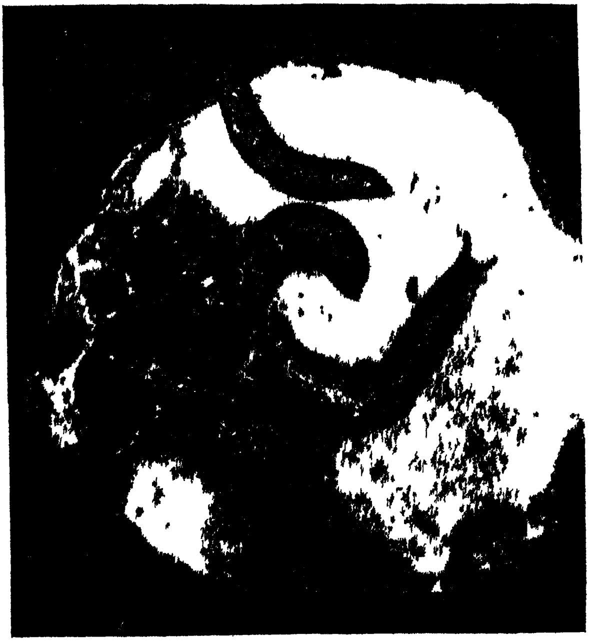


Fig 10 —Agriolimax agrestis. *The Grey Field Slug*

From nature. About natural size. The slugs are shown on the cut surface of a damaged potato.

The Banded Grey Slug (Fig. 41) is broader than the Grey Field Slug and has a soft skin. It is greyish-black with the sides bluish-grey; along each side of both mantle and body there is a black band and sometimes a faint orange band below it. The sole of the foot is white. The length of the slug extended is 1¼ inches. In contrast to the Grey Field Slug the respiratory pore has an anterior position on the right-hand margin of the mantle. Compared to the darker coloured Garden Slug (*A. hortensis*), the Banded Grey Slug is less slimy and broader in proportion to its length. The former, too, has a yellow foot, and secretes a slime that is very sticky and yellow like that of the Banded Grey Slug.

Life-history of Slugs.—The life of the individual Grey Field Slug is twelve to fifteen months, and consists of two distinct stages, the first being one of growth during which it increases in length from about ⅛-inch at the time of hatching to 1 inch four to six months later. There then follows the second or breeding stage, when the slug, now sexually mature, begins egg-laying and continues the process until near the end of its natural existence. Whilst breeding does and can proceed throughout the whole year, it assumes its greatest intensity during late summer and autumn when the combination of temperature, 50°-68° F., and humidity determined by the degree of soil moisture (40 to 80 per cent) would appear to be most favourable to the general activities of slugs. The low temperatures of winter and the high temperatures of midsummer merely serve to induce a temporary cessation or retardation of breeding that is resumed with the return of more suitable conditions. In Britain the lethal effect of climatic extremes on slugs is practically zero, since their well-developed habit of subterranean burrowing adequately protects them against the injurious effects of such extremes.

The spherical *eggs* of the Grey Field Slug are each surrounded by a transparent gelatinous envelope, and are laid during the night in small batches of ten to thirty in crevices of the soil about an inch below the surface. In leas they are found at the roots of grasses, and in arable land at the roots of potatoes, turnips, and other root crops. They also occur in the manure that is spread on stubble and, indeed, under any object or material lying on the ground, such as sacking, under which an atmosphere of high humidity is maintained.

The time required by the eggs for hatching varies with the time of year. In August hatching occurs in three to four weeks, whilst eggs laid in December undergo a period of incubation of not less than three months. From the egg there emerges a young slug that is identical in form with the parent, of which it is, in fact, a miniature edition. Since slugs do not possess a larval stage there is an absence of metamorphosis in the life-cycle subsequent to hatching. Development occurs by a slow process of growth and differentiation.

Slugs and their Environment.—The success of an animal is measured by the average density of its population and the extent of its distribution. According to these criteria the Grey Field Slug at least must be considered to have achieved a high degree of success, since it occurs locally in densities of several thousand per acre. In a stubble field in winter Dr Carrick estimated the slug population as not less than 80,000 adults and 150,000 eggs per acre. So far as distribution is concerned it is widely spread in Europe, Asia, S. Africa, America, Australia, and New Zealand. By comparison, the Banded Grey Slug is much more restricted, being confined to Central and Northern Europe, with the exception that it has established itself in a few places in North America, where it has been introduced. Under certain conditions it undergoes local increases of its numbers, but whereas in the present investigation Dr Carrick found the Grey Field Slug distributed all over the lowland districts of the Lothians devoted to potato farming, the Banded Grey Slug is important as a pest only in the neighbourhood of Queensferry and North Berwick.

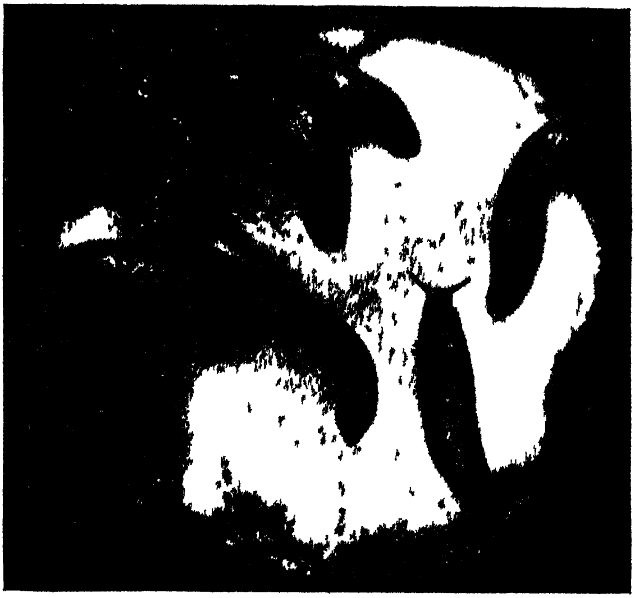


FIG 41.—Arion circumscriptus. *The Banded Grey Slug*

From nature. About natural size. The slugs are shown on the cut surface of a damaged potato.

Part of the success of the Grey Field Slug must be attributed to its omnivorous habit. Like other successful animals it shows little or no discrimination in its choice of food and draws variously upon all kinds of farm crops, garden plants, and even weeds. As a result, it is practically ubiquitous, living in every possible situation.

In addition to available food, desiccation is another very important factor to which the slug is supremely intolerant. It cannot withstand the effects of drying winds nor the direct warmth of the sun. Its environment, therefore, must be one that is continually and highly charged with moisture. This explains why slugs are most abundant on heavy clay soils with a high capacity for retention of moisture. Such soils are prevalent in the lowland farms of the Lothians, where conservation of moisture is further aided by the high organic content of these soils. That moisture is all-important is seen by the annual fluctuation which occurs in the slug population according as the rainfall is above or below the average of 27 inches.

Temperature, too, has important limiting effects on slugs, but in that the range of temperature over which the Grey Field Slug can pursue its activities extends from just below freezing to about 70° F., it is not likely to suffer any serious inhibition on account of temperature over the greater part of its recorded area of distribution.

Slug Habits.—During the day slugs are little in evidence unless the weather be dull and wet. Usually they retire into crevices of the soil, under clods and stones, coming to the surface at night, but only on such nights as are damp, still, and rainless. Even so the individuals of a slug population do not respond uniformly to what are apparently favourable conditions at the surface, and it is probable that at any one time only a part of the total population appears on top of the soil. Hence it becomes important in controlling slugs by the application of contact poisons to select for the treatment an evening when there is a maximum of slug activity at the surface as judged by actual observation. Apart from personal examination there would appear to be no reliable index by which one can decide the suitability or otherwise of weather conditions for slug activity on any particular night. Indeed, it has frequently been observed that the kind of conditions which attract slugs to the surface one night may fail to do so on another, although the conditions may appear to be identical on the two occasions. In any case, it is essential to apply more than one treatment.

Many observers have remarked on the low level of sensory response displayed by slugs. To my mind this is a natural corollary to their habit of indiscriminate feeding and underground burrowing. Normally they are hatched into a world where there is no lack of food, so that the necessity to discover it by active search does not arise. This explains why slugs deprived of food for several days may fail to find a suitable supply near at hand, except by mere chance. The relative inefficacy of certain poison-baits that form attractive lures to such insects as the 'grub' and surface caterpillars may be due to the comparative lack of a sense of smell in slugs. At the same time there is evidence that bran treated with molasses or treacle, as will presently be described, is not completely devoid of attraction to slugs. At least experiments with a bran-treacle poison-bait in the laboratory and the field have given satisfactory results in the destruction of slugs.

Although the different species of slugs are fairly uniform in their behaviour the Banded Grey Slug differs from the Grey Field Slug in two conspicuous features. In the first place, it prefers to feed underground rather than on the surface, and secondly, it is gregarious in its habits and more sluggish than the Grey Field Slug. In localities favourable to its occurrence it is frequently found in communities of about a dozen under stones, decaying vegetation, and old rejected sacks.

Damage done by Slugs.—In the Lothians slugs have achieved their present position of economic importance because of their attacks on the tubers in the field, and subsequently in the storage pits. Since the first attack occurs near the end of September only late varieties of potato are affected. Whilst one variety is as liable to attack as another, Golden Wonder is perhaps most seriously damaged, after which come King Edward, Kerr's Pink, and Great Scot in descending order of injury. To circumvent the slugs a few growers harvest the crop whilst the haulms are still green before the attack has commenced. The inception of the attack is associated with an abrupt change in the feeding habits of slugs during late September and early October. Heretofore they have subsisted on green food, leaves, and stems, but as the season advances this food becomes less nutritious and succulent, and the weather conditions at the surface less propitious. Resort is then had to the tubers underground, and the resulting damage is such as to cause an entire loss of those attacked. Potatoes injured by the Grey Field Slug are characterised by small holes on the outside which give access to the inner burrows. The general surface is not otherwise affected, and the holes may be so obscured by adherent soil that they are readily overlooked. Tubers that have been attacked by the Banded Grey Slug, on the other hand, are diagnosed by larger and more conspicuous entrance holes, and also by large parts of the surface being eaten away. This slug, too, persists in the tuber which it has attacked, with the result that it enlarges its burrow into an irregular cavity. Unlike the Grey Field Slug, which seldom remains in the tubers, the Banded Grey Slug is transported with them to the pits, there to continue its destructive activities in the stored potatoes.

Cause of Slug Infestation.—The primary cause of slug damage to potatoes in the Lothians has been shown by Dr Carrick to be the manurial system in vogue in the cultivation of the crop. About the time that the potato crop is due to be lifted a liberal supply of manure, at the rate of 10 to 12 tons per acre, is laid down on adjacent stubble fields as a preliminary to their preparation for the planting of next year's potato crop. With the lifting of the current year's crop the slug population finds itself without a food supply, and so it slowly but gradually disperses to neighbouring fields, including those that have been recently manured. There is no such thing as a determinate migration to another locality and a new food supply. The stubble is mainly populated by chance migrants, and once established it increases, since the manure offers ideal conditions for breeding and feeding during the winter and spring months. This increase goes on progressively until it culminates in the autumn on the potato crop, which has followed the stubble. There is, however, one important limiting factor which retards the increase and may render the attack negligible—namely, a deficiency of precipitation, especially in the late summer. According to Dr Carrick if the precipitation for the year is below 27 inches an attack of serious proportions fails to develop. Rainfall, it must be remembered, determines the amount of soil moisture, which is important at the time of intensive breeding in autumn.

Control.—Under the present system of heavy manuring on the potato farms of the Lothians it is difficult to exercise effective measures of control. We have seen how slugs are encouraged by manure lying exposed on the stubble during the winter, and how manure helps to conserve moisture on soils that are in virtue of their clayey composition already quite retentive of water necessary to slugs. Postponement of manure-spreading until well after the potato crop is lifted would reduce winter breeding of slugs in manure on stubble, and the early ploughing down of this manure would render it less attractive.

Of other methods of control contact and stomach poisons are available. The contact poison which is generally recommended is copper sulphate or bluestone. Used alone it is dissolved in water to make a 3 per cent solution and applied as a spray. Alternatively 6 lbs. of copper sulphate is mixed with 1 cwt. of kainit and the mixture applied dry at the rate of 3 cwt. per acre. To be effective the copper sulphate must be applied to the upper surface of the slug, when it is almost immediately lethal. As slugs are nocturnal the treatment must be carried out at night and should be renewed at convenient intervals. The time when a contact poison would be likely to give the best results would be after the crop has been lifted, when the slug population is almost wholly on the surface.

Experiments have been made with two poison-baits. One of these consists of ingredients as follows:—

Paris green	1 lb.
Bran	25 lb.
Molasses or treacle	½ pint.
Water	1 gallon.

The bran and Paris green are mixed dry; the molasses or treacle is poured into the water, and the latter added to the poisoned bran. The result is a moist mixture which is sufficiently friable as to be easily broadcast.

A similar poison-bait but more effective is one in which the Paris green is replaced by metaldehyde, sold under the name of 'Meta,' a substance insoluble in water and used as a solid fuel. It has a decided advantage over Paris green in that it is not poisonous to domestic and wild animals, and there is no risk to those who handle 'Meta' in compounding the bait. Another quality in its favour is that it appears to retain its poisonous properties in the bait so long as the bran remains moderately moist and is not unduly drenched by heavy rain. In his experiments Mr Esslemont demonstrated that the 'Meta' bait remained effective in the field after being spread for at least a week. In one experiment there were collected as many as 57 dead slugs on a treated plot of ground of 20 square yards, the equivalent of 12,000 per acre. This number probably represented only a fraction of those that succumbed to eating the bait, which is not immediate in its lethal effects, so that some moribund slugs may contrive to secrete themselves out of sight before being finally overcome. It was noted, however, that the 'Meta' bait exerts a curious effect on some slugs that have ingested it. Slime is so copiously exuded by an affected slug as to form a conspicuous track on the soil surface over which it has crawled. At the end of this track the moribund slug is found exposed. The effect of the poison appears to be such as to inhibit its capacity or desire to gain the protective security of an underground burrow, which is the normal reaction of a healthy slug brought to the surface during a bright day.

At the rate of 25 lb. per acre Mr Esslemont has reckoned the cost of four applications of the bait at about £1 per acre, a figure which is not considered prohibitive for the degree of crop protection which it ensures.

MAINTENANCE OF HEDGES.

REPORT ON DEMONSTRATIONS IN HEDGE MANAGEMENT HELD IN DUMFRIESSHIRE, NOVEMBER 1937.

[*This Report was prepared by the late Mr Christopher J Carruthers, Yr., of Dormont, shortly before his death on 17th January 1938 At a Meeting of Directors of the Society on 1st December 1937 the Chairman specially thanked Mr Carruthers on behalf of the Board, for his valuable services as Honorary Secretary of the Local Committee in carrying through the arrangements for the Demonstrations, all of which he said, had been done in a most efficient manner*]

"GOOD hedges have, in the past, been a characteristic feature of the countryside in many parts of Scotland, have afforded valuable shelter, and have made good fences. In too many cases, however, hedges have become neglected and uncared for, and have ceased to be either ornamental or useful. The art and craft of hedging and hedge management has been dying out.

Fig 42 —*A thin overgrown hedge, bare below, and ready for laying.*

"The object of the Scheme recently inaugurated by the Highland and Agricultural Society of Scotland is to reverse this process, and to show that knowledge of the management of hedges and skill in hedge cutting and laying are worth acquiring.

"Well-kept hedges on a farm or an estate are just as much part of good management as well-kept buildings, or clean land and good crops.

"Many miles of neglected or mismanaged hedges can be seen throughout the country to-day. Some of these hedges are now so weak and patchy as to be incapable of renovation. In most cases, however, with patience, care, and skilled management, such hedges can be restored to vigour and usefulness, although it may take some years to accomplish.

Fig. 43.—*Showing the initial operation of cutting and laying.*

"It is the aim of the demonstrations and competitions to show how this may be done and to encourage all those connected with land management and farming, including farm and estate workers, to take a share in the achievement of this aim."

The above paragraphs were printed as the Foreword to the programme prepared in connection with the Demonstrations in Hedge Management which were held in Dumfriesshire in November 1937. They indicate the purpose of the Scheme for the improvement of hedges throughout Scotland which had recently been inaugurated by the Society.

The matter first arose on a letter from Sir John H. Milne Home, in which he suggested that the Society might introduce competitions and offer prizes for the encouragement of good hedge management. He pointed out that this had been done, with a considerable measure of success, by the Glendale Agricultural Society in north Northumberland.

The Directors of the Society regarded with favour the suggestions for competitions, but felt that, as a first step, demonstrations of hedge laying and other approved methods of management should be held. The Directors further suggested that Local Committees be formed in the different Districts or Counties, consisting of the Local Directors of the Society and representatives of Hunts or other such bodies as it might be decided to co-opt.

Fig. 44.—*Second stage of cutting and laying. Arranging and twining in the brush.*

Such a Committee was formed in Dumfriesshire, and, as a result, a highly successful series of demonstrations was held in the County on 9th, 11th, and 13th November 1937.

The Committee at the outset decided that the demonstrations should be held in the three main Districts of the County, Eskdale, Annandale, and Nithsdale. Sub-Committees were formed for each of these areas, and local landowners, factors, and farmers were co-opted.

Through the courtesy of the proprietors and tenants concerned, suitable hedges for demonstration purposes were easily found, and the demonstrations were eventually held at Evertown, near Canonbie, belonging to the Buccleuch Estates Ltd.; at Dyke, near Dalton, belonging to Colonel F. J. Carruthers of Dormont; and at Holmhill, near Thornhill, also belonging to the Buccleuch Estates Ltd.

On being approached, the Alnwick Estates Co., Northumberland, kindly agreed to provide two skilled hedgers to demonstrate, and opportunity is taken here to express thanks to the Company for their co-operation, and to the men themselves (J. Robinson and H. Breeze), who proved admirable exponents of the art and craft of hedging and impressed all those who saw them with their skill and the obvious pleasure and pride they took in their work.

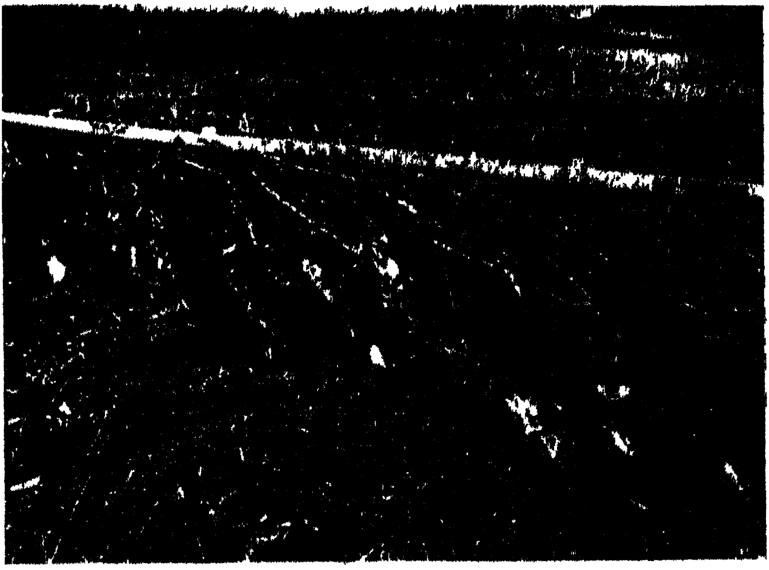


Fig. 45. -*The finished laid hedge. Brush trimmed and dead stakes in position. A light rail has been used in place of a twisted hazel or ash "binder."*

The Local Sub-Committees made all arrangements for providing travelling facilities and lodgings for the men, and for the necessary tools and materials. A printed programme was prepared, which included the Foreword already quoted, a description of the work to be shown, and reference to the competitions proposed to be held. The programme was handed to all those attending the demonstrations, and, it is hoped, proved a useful and instructive supplement to the work actually shown.

A vigorous advertising campaign was carried out, advertisements and news paragraphs being inserted in the Agricultural as well as the local papers. As a result, the attendance of persons interested much exceeded the hopes of the Committee and was very gratifying to those who had carried out the arrangements.

The attendance figures were: Eskdale, 100; Annandale, 113; Nithsdale, 127—a total of 340 persons for the three days.

Fig. 46.—*Another view of the laid hedge. In this example the brush is laid well back to give the young shoots as much room as possible.*

The majority of landowners in the different districts sent their estate men, and owner-occupiers and tenant-farmers were well represented. It is to be hoped that, after the interest shown, there will be a good entry for the competitions, and that the renovation of old hedges in the County will receive the practical attention that it is desired to achieve.

The weather was fortunately fine, but a cold wind made conditions not so pleasant, although it helped forcibly to demonstrate the necessity of good hedges as shelter.

A REVIEW OF THE DEVELOPMENT OF MILK MARKETING.

By SIR JOHN BOYD ORR, M.D., D.Sc., F.R.S., &c.,
Rowett Research Institute, Aberdeen.

A NUMBER of attempts to organise the marketing of milk, made with varying degrees of success since the war, culminated in 1933 in the establishment of the Milk Marketing Boards. As at present constituted, the Boards do not provide a permanent solution for the problem of organised marketing. Their activities led to complaints from consumers and from other branches of the dairy industry, including groups of producers. Some of these were investigated by committees of inquiry, and on the recommendations of these committees, adjustments have been made. It was found necessary, however, in 1935 to appoint a Reorganisation Commission to review the whole position *de novo* from the point of view not only of producers but also of distributors and consumers. At the time of writing the Government is still considering the drastic changes recommended by the Commission.

The wide variations in methods and cost both of production and distribution, and the fact that there were two very different markets—*i.e.*, one for liquid milk and one for manufacturing milk, each taking roughly about half the total output—presented great difficulties in devising a unified scheme, especially a scheme with unified prices. It might have been expected that any scheme, however skilfully devised, would need adjustment in the light of experience. The establishment of the present organisation, which, in spite of its faults, serves the main purpose for which it was devised, is a great achievement, and the degree of success which has attended it is an encouragement to examine and study whatever omissions, miscalculations, or errors may have been made, with a view to adjusting and developing it to meet the needs of the community and deal justly with all interests.

One of the main reasons for the failure of the various schemes for the organisation of marketing to attain complete success is that they have all been planned on too narrow a basis. Producers and distributors organised separately, each in their own interests. Later, more success, especially for the producers, was obtained when representatives of the majority of producers and distributors formed a Permanent Joint Milk Committee. But a third interest, that of the consumers, was not represented in the driving of bargains about prices. Even in the framing of the existing scheme, which is based frankly on the economic interests of producers, the question of the needs of the consumer and the retail price at which he could purchase sufficient for his needs did not receive adequate attention.

In the last two or three years there has been a transfer of interest from the economic requirements of the producer to the health requirements of the consumer. The nation has become health conscious, and aware that of all foods of special health value, milk is of outstanding importance. The Advisory Committee on Nutrition [12], appointed by the Government in May 1935, have recommended that in all future legislation dealing with milk the main object shall be to ensure that milk in the amounts recommended by the Committee as necessary for health—nearly a pint per head per day on an average—shall be made available at a retail price within the purchasing power of the poorest. The national drive for health and physical fitness gives further prominence to the health aspect of the national milk problem. From now on public health interest will dominate agricultural interest. This is foreshadowed in a Parliamentary 'White Paper' of July 1937, which states that "It is still desirable to safeguard the industry against emergency conditions, but circumstances have altered to an extent that now enables the Government to lay relatively greater emphasis on measures designed to promote the increased consumption of liquid milk and the provision of a purer milk supply."

It is unfortunate that these two equally important aspects of the national milk supply should have been considered in watertight compartments. Those interested in public health have no interest in the economic problems of the producer, and, on the other hand, the Milk Marketing Board rightly contends that the responsibility for ensuring that the national supply is such that an amount adequate for health is available within the purchasing power of the poorest does not lie with the Board. The whole position needs to be reviewed from the point of view of all interests, so that the interests of agriculture and those of public health may be reconciled in a common national policy. It is only on this broad basis that a permanent solution of the milk problem is to be found.

It will be convenient if we review here the agricultural and the public health positions separately, and then see to what extent the present system needs adjustment to meet the requirements of both.

AGRICULTURAL INTERESTS.

Development of Marketing.

The voluminous reports of the various Milk Commissions and Committees give a fairly full account of the successive attempts made in the last twenty years to organise the industry. References to these [3, 8, 9, 10] are given at the end of this article. It is unnecessary, therefore, to do more here than to give a general outline of the course of events.

Growth of Distributive Trade.

Until late in the nineteenth century the marketing of milk was relatively simple. Owing to the absence of modern hygienic methods, milk was liable to turn sour so quickly that it had to be delivered to the consumer soon after milking. Cows were milked twice a day, and delivery followed as soon as possible. This is the origin of the 'twice a day' delivery. The milk frequently reached the consumer before it was cold. Indeed, "warm milk" used to be synonymous with "whole milk," to differentiate it from "skimmed milk," which had to be kept for a time to allow the cream to rise and was, therefore, always cold before it reached the consumer. In these circumstances the producer for the liquid milk market had to be within driving distance of the consumer. Dairy farmers were therefore in the immediate vicinity of towns, and indeed many "town dairies" were in the middle of the towns with no grazing land. There was thus no room for any complicated marketing organisation. The producer delivered direct either to the consumer or to a retailer who was usually in a small way of business and in direct contact with the consumer.

In rural districts, far removed from large consuming centres as in the grazing lands of the West, milk was produced not so much for the liquid market as for cheese or butter making, which were usually carried on with stock raising. A considerable part of the revenue of these cheese farms was often derived from sale of cows to the dairies in or near the towns catering for the liquid milk trade. These cheese farms produced milk mainly during the grazing season. The cost of production was considerably less than in the case of the town dairies, which had to feed during the winter to maintain a level output all the year round, and had also to pay higher rents. Although the cost of production was higher in the town dairies, the returns were correspondingly higher, and, up till the time of the war, both were probably about equally profitable. It is important to remember these pre-war conditions, under which there were two different types of dairy farming with different methods and different costs of production, because many of the difficulties met with in the attempt to organise marketing arose from the fact that in framing schemes sufficient consideration was not given to these differences.

Towards the end of last century the distinction between the dairy farms whose output was cheese and those whose output was liquid milk began to break down. With the continued growth of large towns more milk was required than could be supplied by the dairies in the immediate vicinity, and the introduction of cooling and pasteurisation extended the distance over which fresh milk could be carried. The distant producer had no personal contact with the consumer, or even in some cases with the retailer, and it became necessary to have a wholesaler as middleman between the producer and the retailer. The wholesale aspect of milk marketing developed rapidly during the war. A number of new companies were formed to get liquid milk from rural areas which had not previously been tapped. The amount of milk handled by these companies increased, and they became an important part of the machinery of distribution. In 1915 a number of the London wholesale companies which had been competing with each other co-ordinated their activities under the United Dairies Ltd. This went far to organise the wholesale distribution of milk for the largest consuming centre in the country.

Organisation during the War: The Astor Committee.

The system of distribution, however, was not efficient enough to meet the requirements of the war, and in 1917, when Lord Rhondda was food controller, the Astor Committee [3] was appointed, on the instruction of the Cabinet, "to advise as to measures for dealing with problems arising immediately out of the war conditions," and "to consider the general condition of the dairying and milk distributing industries apart from the war, with a view to their being placed on a more satisfactory basis for the future." The Ministry of Food, following the recommendations of the Astor Committee, took over as a temporary measure the control of about eight hundred wholesale companies. During the period of control important improvements in the handling and organised transport of milk were introduced. As a permanent policy the Committee recommended that the Government should secure an option of purchase of the wholesale firms which acted as Government agents, with a view to the State becoming the sole wholesaler of milk. The control, however, ended in January 1920 without the State purchase having been effected.

Post-War Position: Complexity of Distribution System.

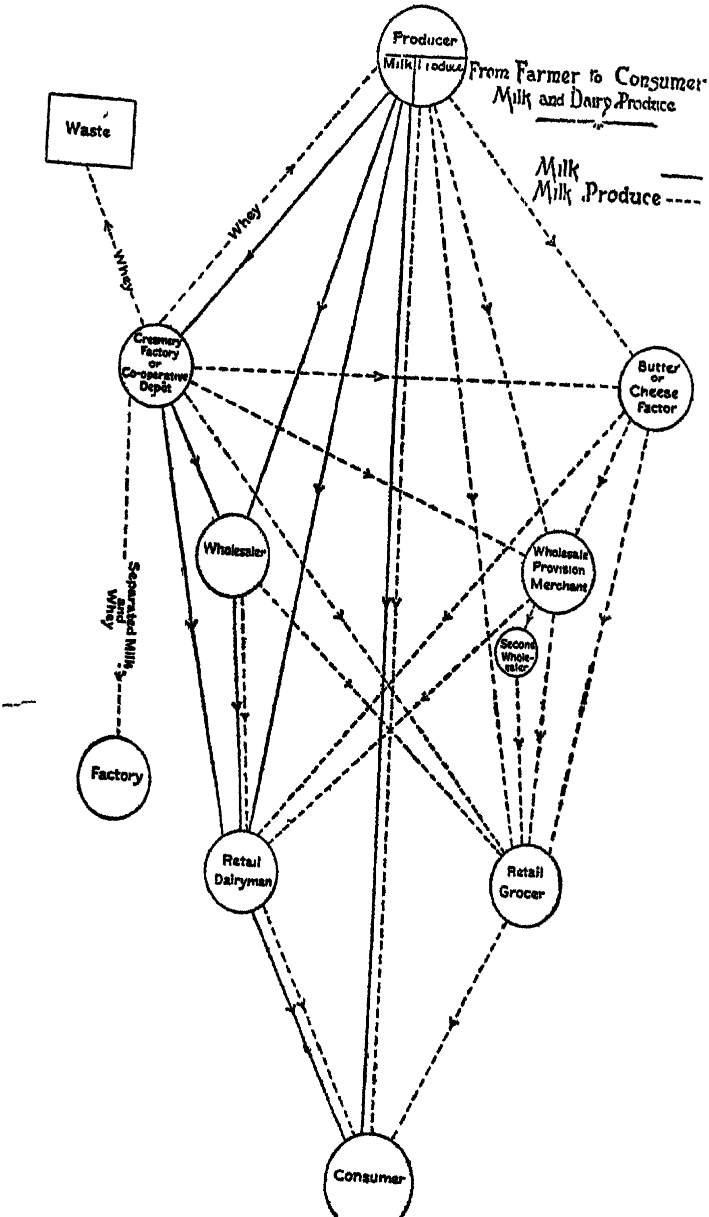
When the control of the wholesale companies came to an end, difficulties in marketing arose. The control had placed the wholesale companies in a strong position. They were able to buy collectively, while the farmers, who had no longer a fixed price, still dealt with them as individuals. There was an immediate sharp fall in wholesale prices which affected the producers most severely, because wholesale prices fell before retail prices. To increase their profits some of the wholesale farms entered the retail trade.

Distribution had now become more profitable than production. The attractive profits of distribution stimulated the activities of farmers' co-operative creameries. In Scotland these organisations were more successful than in England, where they were unable to compete with the established private companies which had a better grip of the retail market, and were, therefore, able to dispose of a larger proportion of their milk as liquid milk. The co-operative creameries, unable to find markets, were forced to manufacture more into butter and cheese, which gave a lower return per gallon.

The position of the producer was now most unsatisfactory. The relatively simple organisation of distribution which had existed in the beginning of the century had now come to be so complicated that the producer in the country had difficulty in finding his way through the maze to the consumer, and by whatever route he might choose to dispose of his milk there was an increasing gulf between the price he received and the price the consumer paid. The diagram on p. 138 illustrates the complexity of the system as it existed in 1922, two years after control was removed. The most fortunate producers were those producer-retailers who still retained direct contact with the consumer.

Price Fixing by Joint Committees representing Producers and Distributors.

On the whole, the problem of the producer was much more acute in England than in Scotland. In the autumn of 1920 the English National Farmers' Union attempted to negotiate prices with representatives of distributors. The attempt failed. The Federation of Distributors themselves arbitrarily decided both wholesale and retail prices without the consent of the producer. By the summer of 1922 the efforts of the National Farmers' Union bore fruit in the establishment of a permanent Joint Milk Council consisting of representatives of various associations of distributors, and representatives of the National Farmers' Union acting for producers. This



This diagram is reproduced by the kind permission of the Controller of H.M. Stationery Office, from the Report of the Departmental Committee on Distribution and Prices of Agricultural Produce (1923).

body negotiated prices in England until the establishment of the Milk Boards. At the same time a similar body in Scotland, consisting of representatives of the National Farmers' Union of Scotland, the Glasgow Wholesale Milk Dealers' Association, the Glasgow and District Dairymen's Association, the Federation of Co-operative Dairy Societies, and the Glasgow Co-operative Societies, reached an agreement on prices for Scotland.

One of the difficulties in fixing prices arose from the disparity between the market value of milk sold for liquid consumption and of milk used for manufacturing cheese or butter. We have no imports of liquid milk to compete with the home supply; but butter and cheese compete with foreign produce, and so their prices fell to the level of world prices. In 1923 it was estimated that a gallon of milk at winter prices manufactured into cheese realised from 4⅝d. to 6d. less than if it had been sold for liquid consumption. Even in winter there is always a variable unsold surplus of milk which has to be manufactured, and in the summer flush the liquid milk market may not take much more than half the total production. In the price-fixing scheme, therefore, it was necessary to differentiate between milk for liquid consumption and manufacturing milk. The latter, which had to be brought into line with world prices for milk products, was fixed at 2d. per gallon less than the average price per pound of Canadian and New Zealand cheese. There was need for a rather complicated method of assessment of the amount of milk from each producer which would be paid for at the liquid rate and the amount which had to be paid for at the manufacturing rate. Broadly speaking, in the former the standard quantity was fixed according to the output in the winter months when production is lowest and the cost of production highest. It may be of interest to note here what prices were at this time. The prices for producers fixed for Glasgow for 1922-23 ranged from 11d. in May, June, and July to 1s. 7d. in the four winter months. The corresponding wholesale prices were 1s. 2½d. to 1s. 10½d., and the retail prices 1s. 8d. to 2s. 4d.

These Joint Committees had, of course, no power to force every person in the dairy industry to conform to these prices, and there was a good deal of under-cutting. In spite of this, however, this new arrangement proved on the whole relatively successful. It certainly prevented further fall in price during a period when the prices of all other agricultural commodities were falling. In 1931 the price which the producer received for milk for liquid consumption was 47 per cent above the pre-war price, while the prices of all other agricultural products, excluding milk, were only 15 per cent above pre-war level. But the distributor fared better than the producer; for, while the price which the distributor paid to the producer fell from 74 in 1923 to 47 per cent above pre-war level in 1931, the price which the distributor charged the consumer fell only from 80 to 70 per cent above pre-war level. There was thus an ever-widening gulf between the price which the producer received and the price which the consumer paid. It must be kept in view, however, that this wider margin had to include the cost of the pasteurising and bottling which were done by most of the large distributing firms.

Mention should be made here of an interesting voluntary movement among producers in the West of Scotland, which led to the formation in 1927 of the Scottish Milk Agency for marketing milk. It was at first successful, and in 1928 extended its sphere of activities by establishing a branch in Aberdeen. Its power, however, gradually declined owing to the fact that producers who remained outside were able to profit by the better prices without bearing any of the expenses of the agency. The membership therefore declined, and by 1931 it had become moribund. In that year the Agricultural Marketing Act was passed. The Scottish Agricultural Organisation Society promoted a marketing scheme under the Act, and the Agency was replaced by the Scottish Milk Marketing Board which came into being in 1933. The Aberdeen Branch was more successful than the parent body in Glasgow. It broke off and formed an independent organisation which was the basis of the Aberdeen Milk Board.

The above review of the period from the beginning of the present century till 1931 shows that the outstanding feature of this period was the development of a complicated distributive system, with the growth of large firms of wholesalers and wholesale retailers which held the pivotal points of the industry and were able to exercise a powerful control. Side by side with the growth of these private and joint stock companies was the development of a distributive milk trade by the industrial co-operative societies. In the beginning of the century the amount of milk handled by these was negligible. In 1919 it was only about 2½ per cent of the total trade in England. By 1931 it had increased to about 14 per cent.

Milk Marketing Boards.

The establishment of the Milk Marketing Boards under the Agricultural Marketing Act of 1931 opens a new chapter in the history of the dairy industry. The Act gives producers, organised under a marketing scheme, statutory powers to control the production and marketing of their product, to fix prices, to prevent any person selling a product without the permission of the Board, to impose levies on the members of the organisation, and fines for failure to comply with its regulations. In April 1932 a Commission of five, with Sir Edward Grigg as Chairman [9], was set up to prepare, in accordance with the provisions of the Act, a scheme for the marketing of milk. The Grigg Commission, though limited in its remit to drafting a scheme in accordance with the Act, considered it necessary, from the point of view of equity and to make the scheme workable, to depart from the principles of monopolistic control by producers. They recommended that the Milk Board to be set up should have representatives of other interests of the community, including distributors and consumers. Prices were to be fixed by a Joint Milk Council on which producers and distributors would have equal powers, and, in failure to reach agreement, the final decision would be in the hands of nominated members. These recommendations, however, were not accepted, and the Board which was set up consisted entirely of representatives of producers endowed with all the powers provided by the 1931 Act.

Four Boards were set up, one for England and three for Scotland, viz.:—

1. The English Board, covering England and Wales.
2. The Scottish Board, covering Scotland south of the Grampians, but leaving out part of Argyll.
3. The Aberdeen and District Board, covering Aberdeenshire and Kincardineshire.
4. The Inverness and North of Scotland Board, covering Inverness, Nairn, Ross and Cromarty, Sutherland, and Caithness.

The Counties of Banff, Moray, Orkney and Zetland, and part of Argyll were not included in any of the above schemes. A Board was set up for the six counties of Northern Ireland. It is referred to later.

The Effect of Marketing Boards on Producers.

Producers as a whole derived great benefits from the establishment of the Boards. One of the most important of these was that the Boards undertook the responsibility for finding a market for the whole output of the milk at a guaranteed price. This is a boon which must be retained under any adjustments of the scheme. Dairy farmers must never again be allowed to revert to the position in which, as isolated individuals, they had either to bargain with powerful companies which held the main key-points of the distributing system, or alternatively to hunt for a retailer who might be willing to buy direct, but who, in that case, was liable to be unreliable for prompt payment. Many of these bought milk at a cheap rate, usually in the summer flush, and in turn retailed it cheap, under-cutting the regular retailers who had built up an established all-the-year-round trade.

In addition to having an assured market, producers as a whole benefited under the scheme by receiving an increased price for the milk produced. The price index number for milk, which stood at 147 in 1931 compared with 100 pre-war, rose in 1935 to 176; whereas for agricultural produce other than milk it fell from 115 to 105. These figures, however, are based on the contract prices for liquid milk, and do not take into account the lower price of milk sold for manufacture. The average gross price, taking account of the manufactured milk, is difficult to estimate, but it was certainly considerably higher than in pre-Board days. It was estimated by the Consumers' Council that under the Board the consumers of London were paying £500,000 more per annum than they had previously done, and the increase in price in smaller towns and villages was in many cases higher than in London. There was also a marked increase in the price to hospitals and other charitable institutions. The increase for the hospitals connected with the British Hospital Association has been estimated at £400,000 per annum. According to some estimates the increased yield to the industry from the whole of the consuming public is as high as £5,000,000 per annum. While a considerable part of this may have gone to distributors, the lion's share has undoubtedly gone to the producers.

Although producers generally benefited by a rise in price, the benefit was unevenly distributed. Indeed, some were worse off than before. The Milk Boards had to deal with milk producers as a body and find a market not only for the farms which had formerly produced for the liquid milk market, but also for the farms which had originally produced for manufacturing butter or cheese. Owing to foreign competition the price of these had to come down to the world level. The Boards therefore suffered a heavy loss on the milk sold for manufacturing purposes. Further, the high price offered by the Board attracted milk which had formerly been utilised by farmers themselves for manufacturing or for stock rearing. The difficulty of dealing with milk, surplus to the liquid market, was greater than had been anticipated. The price of milk products fell, and the amount of surplus milk increased. In the three months beginning January 1933, when the Scottish Board came into operation, the surplus of the Board was 16 per cent. In the corresponding three months of the following year it had risen to 28 per cent, and in the summer of 1935 it rose to just over 50 per cent. To deal with this surplus the Boards acquired or built factories for manufacturing butter and cheese. By 1935 the Scottish Board was itself producing more than half of the manufactured milk products in Scotland. Every gallon manufactured involved the Boards in a loss. To keep them solvent a further levy had to be placed on all producers in addition to the small levy required to defray the cost of administration. The amount of the total levy, which under the Scottish Board went up to over 4d. per gallon, was a heavy burden on those who had formerly produced for the liquid milk market, and especially upon producer-retailers who felt that they were getting little or no benefit from the levy.

This method of subsidising the manufacture of liquid milk was unavoidable in the circumstances. A logical method of dealing with the difficulty would have been to impose a tariff on imported butter and cheese to raise the price of these to a level equivalent to that of milk used for liquid consumption, and this course was strenuously advocated, but was not adopted by the Government.

The result of treating the whole producing part of the industry as a unit was that farms in the rural districts, which had formerly produced milk for manufacture mainly during the summer months when production is cheap, were very much better off under the Board, and many farmers must have made big profits. But producer-retailers were actually worse off. In reply to the complaints of the producer-retailers, it was advocated that the fixing of the retail price by the Board had saved them from the effects of price under-cutting, and that, in any case, owing to the improvements in methods of transport, the liquid market would ultimately have been swamped with milk which had formerly been manufactured, and the alternative to the levy was a catastrophic drop in prices.

Discontent at the results of the scheme amongst certain sections of the producers in England was so strong that an attempt was made for the abolition of the English Board, and in the terms of the scheme a vote was taken in August 1935 in which 79 per cent of producers selling milk under the scheme voted, and the results were [11]: for the scheme, 79,711 (81 per cent); against, 18,747 (19 per cent).

Opposition to the levy from the producers for the liquid milk market was even stronger in Scotland than in England. In the East, milk was produced almost entirely for the liquid milk market, whereas in the South-West, a great part of the milk had originally been produced for butter or cheese making. The producers of the East formed themselves into the Eastern Federation of Producers for the promotion of their interests. As a result of the efforts of this body, a commission of investigation was appointed, and the Secretary of State for Scotland, acting on the recommendation of the Committee, ordered certain adjustments, chiefly of the methods of assessing the levy and of assessing transport charges, which helped to ameliorate the condition of the producer for the liquid market, especially the producer-retailer. Discontent with the scheme was, however, still strong, and there was great difficulty in collecting the levies.

These difficulties culminated in a legal decision which seriously embarrassed the Scottish Board. Under the scheme the Board was entitled to recover from producers who marketed their own milk (*e.g.*, producer-retailers) "such contribution as the Board may from time to time consider necessary to cover the costs of operating the scheme." The cost of operating the scheme was interpreted by the Board as including the difference between the price received by the Board for manufactured milk and the liquid milk price. Mr Ferrier contested this interpretation. In July 1936 the House of Lords decided that the Board was not entitled to impose on producers levies calculated to equalise the returns from the sales of liquid and of manufactured milk. This decision put the Board in the legal position of being liable to return to producers about £400,000 which, according to the decision, had been collected illegally.

The financial embarrassment both of the English and the main Scottish Boards, due to the loss on the sale of milk for manufacturing, was so acute that the Government came to their assistance, and funds were advanced from the Treasury to enable the Boards to pay a standard price of 5d. in summer and 6d. in winter for manufacturing milk. This was provided for in the Milk Acts of 1934 and 1936, which, in addition to this financial provision, provided a sum of £750,000 for improving the quality of milk. This was used mainly for instituting the "attested herd scheme," under which a bonus of 1d. per gallon was paid for all milk from herds which had been attested following three consecutive negative tuberculin tests. In addition, a sum of £1,000,000 was made available for the milk-in-schools scheme, and for propaganda for increased milk consumption, on condition that the Boards contributed on a £ for £ basis.

The burden of the surplus milk fell the more heavily on the English Board. The Scottish Boards got rid of some of their surplus by dumping it on the English market at a price approximating to that of liquid milk. This, of course, further embarrassed the English Board by diminishing its market for liquid milk and increasing the surplus which had to be disposed of at manufacturing rates. Finally, the English Board agreed to pay the Scottish Board an annual subsidy as compensation for undertaking not to exploit the English market.

This very general outline of the effect of the scheme on producers has taken no account of the many adjustments made either on the initiative of the Boards themselves, or on the order of the Ministers concerned acting on the recommendation of committees of investigation. These adjustments, together with the financial assistance from the Government, have enabled the Boards to continue their work pending a Government decision on the recommendations of the Reorganisation Commission appointed in 1935.

The Boards, especially the English and main Scottish Boards, were faced on their inception with a tremendous task which was made increasingly difficult by the appearance of unforeseen problems of the utmost difficulty and complexity. Whatever view be taken of the rightness or wrongness of the principles on which the Boards are constituted or of the decisions taken by them, there can be no difference of opinion about the invaluable services rendered by members of the Boards and by the chief officials. All classes of producers, even those who had genuine grievances under the scheme, are indebted to those members and officials for the strenuous, though often thankless, service which they rendered to milk producers during what have probably been the most critical years in the history of the industry.

The Effect of the Scheme on Distributors.

Owing to the absence of reliable figures on the distributors' margins before the scheme came into force, it is difficult to ascertain with any degree of certainty the extent to which the fixing of prices affected the distributors' margin. In pre-war days the distributors' margin was relatively low, varying in different parts of the country between the limits of about 4d. to 8d. per gallon, being highest in the towns and lowest in rural districts. In Glasgow in 1913 it varied from 4d. to 5½d. By the time the scheme was introduced the margin in the majority of cases probably was between 9d. and 11d. Under the main Scottish schemes, the distributors' margin was fixed at first at 10d. per gallon, and later reduced to 9½d. In England, margins varied in different areas. In London and other large towns it was at first 10d. The margin was raised later by amounts varying from ½d. in rural districts to 2d. in certain towns, with a corresponding increase in the retail price, so that producers did not suffer. In 1935 the English Board attempted to reduce the distributors' margin by an average of five-twelfths of a penny. The distributors made such a vigorous complaint to the Minister of Agriculture that a Committee of Investigation was asked to report, and, following its recommendation, the Minister reduced the margin by one-sixth of a penny. On the whole, the distributors maintained probably at least as big a margin as they had before the Boards were established.

Apart from maintaining the margin, however, the distributors benefited under the scheme because they were protected against under-cutting in the retail market. Further, the large distributors were relieved of any loss of surplus milk, because milk unsold is paid for according to the use made of the milk, the price therefore falling from the high wholesale rate for liquid milk to about that of manufacturing milk. This was a concession, however, which was not extended to small distributors. They had formerly been able to obtain a portion of the milk at manufacturing prices no matter to what use the surplus, not sold as liquid milk, was put. Whatever the reason for this differentiation between large firms and small firms, it has had the effect of driving the distributive business more and more into the hands of the big companies. There is no doubt that these have flourished under the scheme.

Another effect of the scheme, which is of some importance, is the increase in the proportion of the trade done by the industrial co-operative societies. While they sold at the prescribed price, and therefore were not legally under-cutting, they were allowed to give dividends on purchases. In some cases these amounted to as much as 4d. per gallon. This concession, which was not at first permissible for private traders, enabled the co-operative societies to develop their milk trade, and, although a concession was made later, which enabled private firms to pay a dividend, few of them were able to take advantage of this concession owing to the absence of the necessary organisation for the satisfactory registration of sales.

The Effect of the Scheme on Consumers.

The liquid milk market is protected from foreign competition, and, therefore, the price-fixing arrangements made between representatives of producers and distributors from 1922 onwards were able to prevent a fall in price such as occurred in the case of other foodstuffs. Just before the war the retail price of milk varied from 1d. a pint in some rural districts to 2d. a pint in London. In Glasgow in 1913 the retail price was 1½d. per pint in summer and 2d. per pint in winter. Towards the end of the war prices rose to nearly three times these levels, but between 1920 and 1922 the retail price of milk, in common with other foods, fell by about 30 per cent. But from 1922 onwards price-fixing by producers and distributors was able to prevent further significant decrease in price. Taking the index figure as 100 for July 1914 the figure for milk in 1923 was 180; for 1932-33, 165·7, and in 1934-35, the second year of operation of the Board, it had risen to 180·9, whereas the index figure for all foods, excluding milk, fell from 168 in 1923 to 119 in 1934-35. The activities of the Board, therefore, maintained and indeed raised the retail price of milk, and so increased the disparity between the price of milk and the price of other foods.

It is impossible to say what effect the establishment of the Boards has had upon consumption, because the figures given for consumption in pre-war days are only rough estimates. Nor is it easy to say whether consumption has increased or decreased under the Boards, because returns, especially from producer-retailers, in the first year were not very accurate. As a levy on gallonage or cow basis was payable by the person making the returns, the amount was liable to be under- rather than over-estimated, especially as many considered the levy to be unjust. Some, indeed, refused to make any returns. The apparent increase may be due, therefore, to the greater accuracy of returns which followed the enforcement of Board regulations.

Considerable sums of money have been spent under the Milk Act (1934) in an attempt to increase consumption by propaganda. Under the general supervision of a Committee, presided over by Lord Astor, large sums have been spent on newspaper advertising. Probably the greatest benefits to the Boards of this advertising lay in maintaining the goodwill of the Press. In the last two years the establishment of Milk Bars has undoubtedly increased consumption by adults in towns, and the offering of milk at special rates for employees in factories and mines has introduced the milk-drinking habit among manual workers. Making milk available in schools at half-price increased consumption in schools by about 1¼ million gallons per annum [1].

On the other hand, consumption decreased in rural districts where previously it had been possible to get milk at the farm door in some cases at as low a price as 1d. a pint. When fixed prices were introduced the price was raised, and, although under some of the Boards milk can be sold at a lower price in certain prescribed rural districts than in the towns, it is still nearly 100 per cent above the level of pre-Board days. In some districts liquid milk is not available at all, because farmers who had previously kept two or three cows for the convenience of local consumers discontinued this practice as they considered it was not worth while becoming registered producers, and making the necessary returns to enable them to sell milk without contravening the law. On the other hand, the sale of imported dried milk has increased in rural districts.

The Development of Milk Marketing in Northern Ireland.

It will be of interest here to refer to the Northern Ireland Milk Marketing Scheme, which is on a different basis from those in Great Britain. The scheme is based on special legislation

—viz., the Milk and Milk Products Act (Northern Ireland), 1934, and is, therefore, freed from the conditions of the Agricultural Marketing Act, 1931, which was the basis of the Scottish and English schemes.

The power to fix prices is vested in a Joint Milk Council which consists of seven members elected by producers, four elected by distributors, three representing consumers appointed by the Minister of Home Affairs, and three appointed by the Minister of Agriculture, who nominates the Chairman. The staff is appointed by the Ministry. If the members of the Council are not unanimous in fixing prices the decision rests with the members appointed by the Minister of Agriculture. The essential feature of this system is that all interests, including those of consumers, are represented, and, owing to the nomination by the Government of the officials and some of the members of the Board with special powers, the community retains control of its milk supply.

Producers pay a licence fee of 2s. 6d. per annum, and distributors one of £1 per annum. There is a levy of 4s. 8d. per cwt. on all imported and home-produced butter and margarine, except that sold by the producer himself. These, together with a gallonage levy referred to below, provide funds to subsidise manufacturing milk, maintaining it at 5d. per gallon in summer and 6d. in winter, and also to pay a bonus at the rate of 2d. per gallon on high grade milk, suitable for the liquid market, but surplus to it, and sold for manufacture. Also out of this fund grants can be made for the improvement of the health of the cattle, and it bears most of the cost of a whole-time Government veterinary service of twenty officers engaged in inspecting dairies and advising farmers.

There are four grades of milk, designated A, B, C, and D, the first three being for liquid consumption. A corresponds roughly to certified milk; B to Grade A T.T. C must comply with a high standard of cleanliness and be from cows which are under continual veterinary inspection and show no clinical signs of tuberculosis. The gallonage levy on milk increases from one-tenth of a penny on Grade A to 1¾d. on Grade C. The lowest Grade, D, may not be sold for consumption as liquid milk. There is thus a strong incentive to improve the quality of milk.

The scheme has been highly successful. There have been no disputes between different interests, and no need for any Committees of Investigation. Within a year of the establishment of the scheme, surplus funds to the extent of over £60,000 were accumulated. Fixing the price according to quality is a strong inducement to clean up herds. The consumer has, therefore, a milk supply which is rapidly improving in safety. It is also cheap. In 1935 milk was available for the consumer at 1½d. per pint in rural districts, and in Belfast there were nearly 1000 shops where it was available for the consumer on the 'cash and carry' basis at 3½d. per quart, as against an average of 6d. per quart in England.

The producer-retailer is in a more fortunate position than in Great Britain. The gallonage levy on the efficient producer selling Grade A or Grade B is a small charge for a stabilised scheme which reconciles all interests and includes the whole-time free services of twenty veterinary officers for the six counties of Northern Ireland.

PUBLIC HEALTH ASPECT OF MILK SUPPLY.

Cleanliness of Milk.

Until the last two or three years the interest of public health authorities in milk was centred almost exclusively on the prevention of milk-borne diseases, especially tuberculosis. Owing partly to the tightening up of regulations affecting dairies, but probably even more to the efforts of Colleges of Agriculture and of pioneers in the industry itself, of whom there have been and still are many outstanding examples in Scotland, there has been a rapid improvement in methods of handling milk and in the number of herds which are free from tuberculosis. The quality of milk in this country has now reached a high standard, and the extravagant statements sometimes made on the dangers of disease being conveyed by milk are not warranted.

There is at present a strong movement for compulsory pasteurisation of all milk. This propaganda for compulsory pasteurisation should be regarded with caution, because commercial interests are involved. Compulsory pasteurisation would mean the elimination of the producer-retailer and the small distributors. It is not to be wondered at, therefore, that the large distributing companies lend their powerful influence to the movement for compulsory pasteurisation. There is no doubt that all milk liable to convey disease should be pasteurised, but the ideal to be aimed at is a milk supply produced from cows which are free, not only from tuberculosis, but also from contagious abortion, mammitis, and any other disease which may be conveyed to human beings, and handled in such a way that there is no liability to contamination. There must be no relaxation of efforts to clean up herds until this ideal is reached.

Thanks to the funds provided by the Government under the 1934 and 1936 Milk Acts, and the inducements offered by the Boards, the number of disease-free herds is increasing. Under the English Board the sales of certified and Grade A T.T. milk were exempt from control, and the benefits of exemption, which freed them from paying a levy, led to an increase in the number of certified and Grade A T.T. herds. Under the

Scottish schemes the sale of these Grades of milk is not exempt, but a special premium is paid. The following table shows the extent to which these benefits have led to the cleaning up of dairy herds:—

England.			Scotland.		
	Certified Herds.	Grade A T.T. Herds.		Certified Herds.	Grade A T.T. Herds
1933 .	316	258	1932 .	103	103
1936 .	362	686	1935 .	122	290

Dairy farmers can produce clean milk from healthy cows, and the rate at which the national milk supply can be improved in this respect depends upon the inducement offered. There is no dairy farmer in the country who would not clean up his herds provided he had the necessary capital and the additional returns were sufficient to cover the higher costs of production of Certified or Grade A T.T. milk.

Effect of Level of Consumption on Health.

An increased consumption is even more important for national health than an improvement in the quality. What has been called "The Newer Knowledge of Nutrition" has shown that a great deal of the ill-health and poor physique which are so prevalent can be attributed to deficiencies of protein, mineral salts, and vitamins in the diet. Milk is rich in these, and a sufficient supply would make good about 90 per cent of the deficiencies in poor diets. In the well-known tests with Scottish schoolchildren in 1927 [15] and 1928 [6] it was found that the giving of milk daily in quantities of from three-quarters to a pint and a quarter per head, according to age, led to an increase of 20 per cent in the rate of growth and a marked improvement in health and physical fitness. The Nutrition Advisory Committee, set up by the Government in 1935 [12], considered the kind of diets in common use and their relation to health, and were so impressed by the necessity for increasing milk consumption that they submitted to the Government a report recommending that every child should have not less than a pint and a half of milk per day, every pregnant and nursing woman two pints, and adults on an average about half a pint. The Committee considered these the minimum amounts necessary for health. They recommended that all legislation dealing with milk should have as its first objective the increase of consumption to this level. An International Committee, appointed by the League of Nations to report on dietary requirements for health [5], recommended that on an average for European countries and America consumption for women and children should be one litre per day—*i.e.*, about a pint and three-fifths.

Investigation has shown that as the consumption of 'protective' foods increases, health and physique improve. The main protective foods are milk, fruit, vegetables, and milk products. The extent to which consumption of these has risen since pre-war days is shown by the following table :—

PERCENTAGE INCREASE IN CONSUMPTION (1934) COMPARED WITH 1909-1913.

Fruit.	Vegetables other than potatoes.	Eggs.	Butter.	Cheese.	Milk.
88	64	46	57	43	nil

The pre-war figures are those of Sir Alfred Flux cited [14]. *It is impossible to get accurate figures for milk. Pirtle* [16] *estimates consumption in Britain in* 1914 *at* 22·2 *gallons per head. Estimates for the present day are rather below that level.*

Although the average consumption of milk has not increased, public health authorities have supplied a certain amount of liquid or dried milk to many necessitous mothers and children.

This improvement in the national dietary has been accompanied by a marked improvement in health. Since pre-war days infant mortality has fallen from 112·8[1] to 82·3,[1] and in England from 110[2] to 59.[2] Diseases of malnutrition, like rickets, have greatly decreased, and children leaving school to-day are over an inch taller than children of the same age in pre-war days. Of all the protective foods, milk is probably the most important for health. If consumption were increased up to the level recommended by the Nutrition Advisory Committee there would be a further marked improvement in national health and physique. Consumption in other countries, notably in the Scandinavian countries, is much higher than in Britain, and there is reason to believe that the health and physique of the youth in these countries is improving more rapidly than in ours.

The importance of milk has been recognised more in some other countries than in Britain. Even during the food shortage in Germany in 1919 provision was made for reserving milk for the children. According to the regulations, every child under three years of age was entitled to one pint of milk, the amount decreasing with age. This foresight on the part of the German nation in 1919 has more to do with the physique of the German youth to-day than the recently introduced

[1] Average 1911-15. [2] 1936.

physical training in labour camps. In our country, even in the period when the glut of milk was offering an almost insoluble problem, the majority of children received less than a pint per head per day. In the poorer families many of them received nothing but a little imported skimmed milk. There are roughly about ten million children in this country whose physique in adult life will depend largely upon the amount of milk they receive. The public is beginning to realise that the children's health and physique is of even more importance than the protection of the economic interests of 175,000 milk producers, or of distributors who have shown that they are quite capable of looking after their own interests.

THE FUTURE OF THE MILK INDUSTRY.

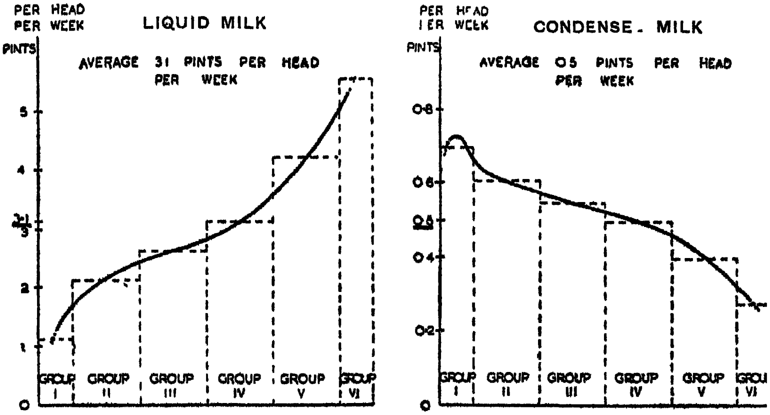
Recommendation of Reorganisation Commission.

The chief recommendation of the Reorganisation Commission appointed in 1935 [10] was the establishment of an independent and impartial Commission of a Chairman and four members appointed by Ministers, and, therefore, responsible to the Government. The Commission was to fix prices, administer funds made available by the Government, and co-ordinate the various interests concerned. This recommendation amounts to the transfer of the statutory powers held by the Boards, which are representative of producers only, to a Commission which, through the Government, is responsible to the whole community. The establishment of such a Commission would be a move in the right direction, but it would involve dual control with divided powers which might prove to be unworkable. At best it might only be a temporary adjustment.

The Objective of a National Milk Scheme.

From the point of view of the State, the main objective of any reorganisation of marketing is to ensure that a sufficient amount of milk of the right quality is made available within the purchasing power of the whole community. The present average consumption of milk is about 0·4 pint per head per day. The amount required is about 0·8 pint per head per day. The diagram (p. 153) gives an indication of the consumption of milk at different income levels.

It will be seen that the wealthiest part of the community already consumes sufficient milk, but consumption falls as family income falls. The average working-class family cannot afford to buy sufficient milk at its present retail price. At 3½d. per pint, the present average price, the cost of the amount of milk needed for a family with a father, a pregnant or nursing mother, and four children is 16s. 1d. per week. The high cost puts the amount required for health beyond the purchasing power of those who need it most. According to a recent investigation in an industrial area, 74 per cent of the children were in families which could not afford to purchase sufficient milk, even taking into account the amount provided by the milk-in-schools scheme. Giving a third of a pint of milk at half-price to schoolchildren, and supplying dried milk free or at reduced rates to mothers and infants, only touches the fringe of the problem of supplying an adequate amount of milk to the poorer half of the population. To bring consumption up to the required level, milk would need to be made available to the poor at 1d. or 1½d. per pint. This can be done only by subsidising consumption by an Exchequer Grant and by reducing the cost of distribution.



Scale for Condensed Milk is six times that for Liquid Milk.
Groups arranged according to family means, Group I. poorest, Group VI. wealthiest.

On the other hand, if milk production is to be increased by 50 per cent, the amount required to supply the needs of the community, then the prices offered to the producer will need to be raised. Milk production is an exacting seven-day-in-the-week occupation. It demands high technical skill from farm workers and constant expert supervision from farmers. To retain and attract more farmers and workers in the industry, the profits from dairy farming must be higher than those from less exacting branches of agriculture. The only way to increase production is to pay a remunerative price to induce farmers to extend production, and the only way to procure milk of high quality not liable to convey disease is to pay a higher price for a higher quality.

THE KIND OF ORGANISATION NEEDED.

Everyone who has studied the milk problem realises the need for a reorganisation of distribution. Schemes have been suggested for the reduction of the number of small distributors and for the registration of the remainder under a Distributors' Scheme with fixed prices for distributors. But organisation should begin not with the retail distributors, but with the wholesale dealers. The wholesale depots are the key-points of the industry.

The simplest form of reorganisation would be for a New National Milk Board, nominated by Ministers and responsible, therefore, to Parliament, to take over the existing Boards with their assets, liabilities, staffs, and organisation. The National Milk Board would take over, at a price fixed by arbitration or otherwise as decided upon, existing wholesale depots and build new ones in large consuming centres where facilities for wholesale handling of milk are inadequate. The Board would control these locally through area committees on which Public Health Authorities would be represented, so that the milk supply would meet their requirements.

The Board would thus become the national wholesaler. From these depots it would make milk available to the retailer, bottled and ready for sale, at a price depending on the size of the Exchequer Grant voted.

Shops would be allowed to sell on the 'cash and carry' principle. This would divide the present retail price into two —viz., the cost of the milk and the cost of delivery. Families who could not afford to pay for delivery could collect the milk from the shops.[1]

There would be no fixed retail price for delivery. The retailer would rightly charge as much as he could, but the consumer, with the 'cash and carry' method of purchase open to him, would never need to pay more than he considered the service of delivery worth.

The producer would be offered a price which would call forth the additional milk needed as consumption increased. To enable the farmer to plan ahead, the guaranteed price for the different seasons would need to be fixed and announced about a year in advance.

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[1] It is sometimes stated that the poor would not buy more milk even if the price were reduced. Reliable information, both from home and foreign sources, indicates that a fall in the price of milk is followed by an increase in consumption, and a rise by a decrease.

Thus, in an investigation into the consumer demand for milk [2] E. R. Bransby found that in the mining class an increase in price of liquid milk of from 6d. to 7d. per quart resulted in a decrease in consumption of 6 per cent. In Switzerland a rise in price of 6 per cent was followed by a decrease of 5 per cent.

On the other hand, when the cost of milk fell in Denmark between 1928 and 1933 by 18 per cent, consumption increased by 28 per cent. In France, during the same years, a decrease in price of 6 per cent was followed by an increase in consumption of 10 per cent [13].

There would be no need for compulsion or for the present complicated system of levies and prices. The price offered for milk delivered at the depot would be a net price according to quality, with no deductions, and for milk collected at the farm, this price less cost of collection.

Any producer would be free, either to accept the offer and sell to the Boards, or to dispose of his output by direct sale to retailers or consumers so long as the quality was up to the standard.

Amount of Subsidy Needed.

Practically the whole of the liquid milk at present consumed is delivered to the consumer's home. The experience of Belfast suggests that, even if milk were made available on the 'cash and carry' basis at a cheap rate, present consumers would continue to have their supplies delivered even at a much higher price. The milk sold on the 'cash and carry' basis at say 1½d. a pint would therefore be mainly additional to present sales. Even at 1½d. a pint the additional sales would yield a higher return to the Board than disposal for manufacturing purposes. A Board controlling the wholesale depots and free to organise distribution for maximum sales could increase consumption and its own profits without any subsidy.

The reorganisation of wholesale distribution round depots would effect economies in the cost of collecting milk from producers, in pasteurising and bottling, in delivery to retailers, and in the wholesaling of surplus milk, which could be handled as one national pool though not, of course, necessarily at one centre. It has been estimated that a complete reorganisation of distribution, including the retail trade, would effect a saving of about £10,000,000 per annum. As far as the producer and the consumer are concerned this is lost money, which might be employed in reducing the cost to the consumer and raising the price to the producer. Reorganisation of the wholesaler is the first step in reorganisation of distribution. Indeed, if the wholesaler be reorganised so that milk is made available at the lowest possible price on the 'cash and carry' basis, retail distribution can be left to adjust itself to meet the varying demands of consumers who wish milk delivered at their door.

If milk were available at 1½d. a pint there would be less need for the milk-in-schools scheme and for the supply of milk at cheap rates to mothers and children of pre-school age. This would effect a saving of the greater part of the present Public Health expenditure on cheap milk for the poor.

It is impossible to say how long it would take a National

Board to bring these changes about, or to estimate with any degree of accuracy the cost of taking over existing wholesale organisations and establishing new depots. This would involve capital expenditure, the interest on which would need to be met. Nor is it possible to estimate what the possible savings would amount to in the first two or three years. It would be necessary for the Government to make a grant of an arbitrary amount to begin with, say £10,000,000 per annum, and adjust the grant in the light of experience.

Benefit to Home Trade.

A few years ago a suggestion to spend £10,000,000 a year on a scheme to make a sufficient amount of milk available at a price within the reach of everybody would have found little support. Even to-day many would argue that the country could not afford to spend such a large sum on a scheme of this kind. If the money were being sent out of the country there might be something in this argument. But as the money would all be spent at home, the country as a whole, so far as the money is concerned, would be neither poorer nor richer. The only difference would be that £10,000,000 a year more would be in circulation to the great benefit of our home trade.

In times of depression, with much unemployment and poverty, the amount of the grant could be increased to enable the retail price to be reduced in proportion to the decrease in purchasing power. On the other hand, in prosperous times, when purchasing power was high, the amount of the grant could be reduced. By this means the consumption of milk could be kept constant and the milk industry stabilised and saved from the effects of recurrent trade depressions. The additional money going into circulation *via* the Milk Board could be regulated according to economic conditions and would act as a flywheel during trade depression by helping to maintain purchasing power which is now recognised to be the chief factor in maintaining trade and industry.

Freedom for Producer and Retailer.

Another argument which could be brought forward is that the scheme involves virtual nationalisation of the wholesale milk trade. But that is the only logical outcome of the present situation. It is justified on the grounds that both in peace and war the nation must have control of its food supply. As a matter of fact, it would involve far less interference with trade than the present scheme. The present restriction would be removed and the producer and the retailer would be free to run and develop their business as they pleased. They would also have the invaluable benefits of a sure market with a guaranteed price for the producer and a sure supply at a fixed price for the retailer.

Scheme in line with Recommendations of Astor Committee.

The writer was a member of the 1935 Reorganisation Commission and would have recommended a scheme on these lines worked out in greater detail, but the Commission was limited in its remit to making recommendations within the provisions of the 1931 Agricultural Marketing Act, and this scheme violates the fundamental principle of the Act. It was, however, in order for the writer to submit an addendum to the Report [10] expressing the view that the recommendations of the Commission, far reaching as they are, do not go far enough, and that the final solution of the problem of milk marketing will be found in national control of the wholesale trade. It is significant that the Astor Committee, which investigated and reported before the 1931 Act, and was, therefore, not restricted in its remit by the provisions of the Act, recommended that the State should buy out the wholesale firms and become itself the wholesaler of milk. These proposals are on the same lines as the scheme suggested here, except that the wholesaling, instead of being the concern of the Government, would be organised by a Board running as a non-profit-making public utility company subsidised by the Government, and therefore responsible to the nation.

Changes in the Immediate Future.

During the Great War the Government found it necessary to take over the wholesaling of milk and organise distribution. Lord Rhondda, the Food Controller, intended to maintain and develop the scheme on a permanent basis. Unfortunately, he died in 1918 and the scheme was lost in the general measures of post-war decontrol. If war should come again, organisation of wholesaling on a national basis by the present Boards, amalgamated into a National Board directly responsible to the Government, would be an essential part of Food Defence.

If war does not come the change may be slower, but it will be no less inevitable. This is already recognised by some of the far-sighted leaders in the industry. The Scottish Board, in a memorandum submitted to the Reorganisation Commission, recommended that the Board, instead of being elected by producers only, should be nominated by Ministers to represent all national interests.

At the time of writing the Government has before it a number of recommendations on milk. The Reorganisation Commission has stressed the importance of reorganising distribution and freeing retail price to reduce the retail price as a means of increasing consumption, and it has recommended the formation of a permanent Milk Commission with power to fix wholesale price and provided with a Government grant to promote improvements in distribution. The Children's Minimum Council [7] has urged the necessity for a supply at special rates to all children and pregnant and nursing mothers. This means a supply at a special rate to about 10,000,000 people. The Government Advisory Committee on Nutrition has recommended that legislation should be directed to making a pint and a half of milk for every child and adolescent, and two pints for every mother daily, available at a price within the purchasing power of the poorest.

In the face of these recommendations the Government must act. Unfortunately, there is no single Minister responsible for all the different national interests in milk. The Ministry of Agriculture deals with the economic interests of producers; the Ministry of Health with the requirements of consumers; the Board of Trade with imports of dairy products; the Home Office with the North of Ireland Scheme; and the Dominion Office with the trade interests of the Dominions in our market for milk producers. In these circumstances any immediate change is likely to be, not a bold simple scheme which would require to be pushed through against vested interests, but a slow development by piecemeal measures. A Milk Commission with limited powers and limited funds will probably be set up. This will foreshadow the National Milk Board. An attempt may be made to reduce the retail price by rationalising retail distribution. There will also probably be an extension of the schemes for supplying cheap milk to mothers, children, and adolescents. It will ultimately become clear that a national scheme making milk available to anyone willing to take the trouble to get it, irrespective of age or class, will cost less than a complicated scheme which provides cheap milk under restrictions for one-half of the population and dear milk for the other half. It is probable that, if the Milk Commission be appointed, it will, after two or three years' experiment, bring forward with the goodwill of the Boards a scheme for organisation of distribution with wholesale depots as the central points, and with a guaranteed price to producers and a fixed low price to retailers, and the abolition of levies, fines, and restrictions.

In our democratic country we move slowly, proceeding by trial and error. Changes must wait upon the growth of well-informed public opinion, and, if they are to be permanent, they must be brought about with the goodwill of all concerned. Though progress is slow it is sure, and takes account of all vested and other interests. In the last twenty years the organisation of the industry which began under the stress of war has made great progress, and there is every indication that in the near future a scheme, based on experience and reconciling the interests of agriculture, public health, and trade, will emerge.

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GRASSLAND IMPROVEMENT.

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The main purpose of this article is to discuss the bearing of recent research, and of certain new ideas, upon the farmer's problem of increasing the productivity of his grasslands. It may be well to begin, however, by glancing at past history and reviewing the present position.

Practically nothing was done to improve the grasslands of Scotland until about the middle of the eighteenth century. At that date very little hay was made. In summer the bulk of the live stock grazed on mountain and moorland pastures, of which the area was considerably larger than it is to-day. There seem to have been only very small areas of good natural grass, but there was a very considerable amount of unsown or tumble-down pasture on the outfields. These outfields were farmed on a primitive system of shifting agriculture, a given area being cropped with oats until the yield would no longer repay seed and labour; then it was abandoned and left to form a sward of indigenous grasses and weeds. In the earlier years of the 'ley' the herbage was naturally poor and scanty, and by the time that a sole of grass had established itself the land was generally considered fit to be ploughed again.

Between 1760 and 1810 large areas of hill and moor were enclosed, and were reclaimed by drainage and liming. These new fields, together with the outfields, were gradually brought under a new type of rotation; grass and clover seeds began to be used in the making of leys, and root crops provided better facilities for cleaning the land. The choice of pasture plants was at first limited. A typical mixture of the period about 1770 included about two bushels of perennial ryegrass, 10 lb. red clover, 4 lb. Dutch white clover, 2 or 3 lb. trefoil, and often 3 or 4 lb. of ribgrass (plantain).

Italian ryegrass and alsike clover were introduced in the eighteen-thirties, but otherwise grass mixtures were little altered until nearly the end of last century. The greatest step of progress during last century was the use of bones and bone dust, which were applied in large quantities (and with very striking effect), especially between 1820 and 1850. Potash manures, which came into use in the 'seventies and 'eighties, proved of great value on the lighter types of soils and enabled many farmers, for the first time, to get regular and complete success with red clover.

By the 'eighties a large range of 'natural' grasses were to be found in seedsmen's lists, but these were included in mixtures only where land was to be laid away to permanent grass. The ordinary rotation grass was still produced with 'commercial' strains of ryegrass and clover only. A usual mixture included about 1½ bushels of perennial ryegrass, three-quarters of a bushel of Italian ryegrass, 6 lb. red clover, 2 lb. Dutch white clover, and 2 lb. alsike. Little attention was paid to the strain or country of origin of the seed, even in the case of red clover. Such mixtures produced, in the first year, very fair swards either for hay or grazing, but these deteriorated very quickly. By the middle of the second season the clover was usually dying out, the ryegrass was becoming thin and stemmy, and weed grasses—especially Yorkshire fog—had begun to make rapid progress.

In the last few years of the century the ideas of Elliot of Clifton Park, near Kelso, attracted a good deal of attention. Elliot contended that perennial ryegrass was an unsuitable plant for long leys, especially on the poorer and thinner classes of land. He excluded it altogether from his own mixtures, replacing it by a rather wide selection of more persistent, deeper-rooting and more drought-resistant species—cocksfoot, tall oat-grass, tall fescue, crested dogstail, and others. He also included, besides clovers, a number of miscellaneous herbs—yarrow, burnet, ribgrass and kidney vetch.

Elliot's views were doubtless very extreme, but his work served to direct attention to the value of 'natural' grasses in rotation mixtures, and numbers of farmers began to include cocksfoot, timothy, meadow fescue, and occasionally others.

The early years of the present century brought several new ideas and new resources close upon each other's heels. First was the realisation of the value of finely ground Bessemer basic slag as a cheap, abundant, and efficient substitute for bones and superphosphate. Second was the discovery, or rather rediscovery, of the great value of wild white clover. Thirdly there were the beginnings of an understanding of the importance of competition between one species and another—for example, of the harmful effect of Italian ryegrass, in a hay crop, in suppressing clover, and of the adverse effect of perennial ryegrass upon meadow fescue. Fourthly was the recognition of the importance of the strain and country of origin of seed—at least in certain cases like that of red clover.

The type of mixture which now became standard for three or four year leys, and for which the late Professor Gilchrist of Newcastle deserves the chief credit, included only moderate quantities of perennial ryegrass, considerable quantities of cocksfoot and timothy, and at least late-flowering red and wild white clovers. Alsike clover and one or more bottom grasses (rough-stalked meadow-grass, dogstail, &c.) might be added under particular conditions. Italian ryegrass was excluded altogether, or severely restricted in quantity, wherever the first year's crop was to be used for hay.

Such mixtures are still in general use, and in many cases give quite excellent results; indeed, where the soil is in good general condition and adequately supplied with phosphate and potash, and where the ley is to be left down for no longer than two or perhaps three years, it is difficult to suggest anything better. The ordinary 'commercial' strains of ryegrass persist longer when grown in mixture with wild white clover, and the two together keep out weeds. It is still true, however, that on poorer soils, and even on better land after the third year, the sward is liable to invasion by bent-grass, Yorkshire fog, and other inferior plants.

Nobody can doubt that the past thirty or forty years have seen a marked improvement in the quality and stock-carrying capacity of rotation grass in Scotland. The permanent pastures on the better classes of land have also in many cases improved. On the other hand, it is easy to find, in most districts, fields that used to be ploughed in regular rotation and then carried very fair swards, but which have now gone back to very poor old grass. In some cases the land has been invaded by whins, rushes, or heather, and the land is now to be classified rather as rough grazing than as permanent pasture. The immediate causes are the neglect of liming and phosphatic manuring, the deterioration of drainage systems and the abandonment of the plough; all of which are, of course, consequences of agricultural depression. There is also plenty of evidence that hill and mountain grazings, over wide areas, are deteriorating; bracken is spreading fast on the best of the hill land, while on the higher hills the heather is often giving way to white bent (*Nardus*) and other relatively useless plants.

The net effect of all these changes has been a balance of improvement; the improvement of the rotation grass has more than outweighed the deterioration of the second-rate permanent grass and of the hill grazings. The stock-carrying capacity of the pastures has improved, on the whole, during the past forty years, and hay yields have risen by nearly ten per cent. The net effect, however, varies from one county to another, and it seems worth while to consider some actual statistics.

The following tables give, for six Scottish counties, the areas of the three classes of grazings and the average numbers of cattle and sheep which they carried in the years 1893-95 and 1933-35. The comparison is thus between recent figures and those of forty years earlier—*i.e.*, before basic slag or wild white clover or 'natural' grasses were in use.

In order to reduce the grazed area to a single figure, the acreage of mountain and heath-land has been divided by four, and the figure so obtained has been added to the total area of permanent and temporary pasture. The assumption that one acre of improved pasture is equivalent to four acres of rough grazing cannot, of course, be generally true, but the calaculated figure of 'pasture units' gives a much better measure of actual grazing resources than the total area of grazed land.

The live stock numbers have similarly been reduced to single figures, called 'cow units.' A cow or an in-calf heifer has been taken as one unit, all other cattle as half-units, a ewe with her lamb or lambs as a third of a unit, and a yearling sheep (gimmer or wether) as a sixth of a unit. This calculation, of course, takes no account of the breed or type of the animals, and the 'cow unit' will not be the same thing in different parts of the country. The figures, again, do not take account of improvements in the quality of the live stock during the forty-year period. The conclusions to be drawn can therefore not be precise.

TABLE I.—PASTURE AREAS AND LIVE STOCK NUMBERS, WIGTOWNSHIRE AND BERWICKSHIRE.

	WIGTOWN.			BERWICKSHIRE.		
	1893-95.	1933-35.	Percentage Change	1893-95.	1933-35.	Percentage Change
Grazing (Acres)—						
Mountain and Heath .	104,879	130,370	+24	69,652	78,980	+14
Permanent Pasture .	27,099	52,959	+96	39,336	49,213	+25
Temporary Pasture .	62,203	47,687	−24	50,995	64,604	+27
Total Pasture Units .	110,188	126,720	+15	104,261	129,613	+23
Live Stock Numbers—						
Cows and Heifers in Milk or in Calf .	28,900	32,408	+31	3,202	6,976	+117
Other Cattle .	24,243	32,715	+34	14,541	20,936	+44
Breeding Ewes . .	47,677	67,654	+42	106,305	147,039	+38
Lambs . . .	45,118	69,553	+54	139,689	203,561	+46
Other Sheep . .	28,306	16,219	−26	55,815	41,476	−26
Total Carrying Capacity as 'Cow Units' .	56,631	74,020	+31	55,709	73,368	+35
'Pasture Units' per 'Cow Unit' . . .	1·95	1·77	..	1·87	1·77	..
Lambs per hundred ewes	97	103	+ 6	131	138	+ 7

Table I. shows the changes in two southern counties, each with a relatively large proportion of low and improved land. In Wigtownshire the number of pasture units increased by fifteen per cent, while the quantity of live stock carried rose by thirty-one per cent. A 'cow unit' required 1·95 units of grazing in the earlier period against 1·71 units in the latter. It is certain that the live stock output has risen in a greater degree than the carrying capacity of the land; yields of milk are certainly higher, and the number of lambs per hundred ewes has risen from 97 to 103. The size and quality of the lambs have doubtless improved also. Here, then, the general quality of the grazings must have improved very much.

Berwickshire shows a twenty-four per cent increase in 'pasture units,' while the number of 'cow units' has risen by thirty-two per cent. The statistics show a rise in lamb numbers, per hundred ewes, from 131 to 138, but the actual improvement may well have been greater than this, for it seems very probable that an increased proportion of lambs are sold fat before the date (4th June) when the statistical returns are made. No doubt more supplementary food is used nowadays for stock on the grass, but this may be more then balanced by the improved quality and earlier maturity of both sheep and cattle. Here, then, as in Wigtownshire, is clear evidence of progress; the grassland as a whole is substantially better than it was a generation ago. This conclusion would probably apply generally throughout the whole of lowland Scotland.

Table II. gives the corresponding figures for Selkirk and Peebles, two counties with a small proportion of low ground and a large proportion of good hill sheep land.

TABLE II.—PASTURE AREAS AND NUMBERS OF LIVE STOCK, SELKIRK AND PEEBLES.

	SELKIRK			PEEBLES.		
	1893-95	1933-35.	Percentage Change	1893-95	1933-35.	Percentage Change
Grazing (Acres)—						
Mountain and Heath .	130,818	141,485	+ 8	147,795	166,118	+12
Permanent Pasture .	10,162	14,597	+44	14,697	27,872	+90
Temporary Pasture .	9,046	6,239	−31	12,439	8,514	32
Total Pasture Units .	45,372	49,133	+ 8	56,095	69,010	+23
Live Stock Numbers—						
Cows and Heifers in Milk or in Calf .	1,358	1,650	+21	2,095	2,690	+28
Other Cattle . .	2,178	2,606	+20	4,805	4,917	+ 2
Breeding Ewes . .	81,225	85,093	+ 5	82,395	91,975	+12
Lambs . . .	77,726	79,482	+ 2	78,018	87,723	+12
Other Sheep . .	21,312	24,007	+13	26,965	22,955	− 15
Total Carrying Capacity as 'Cow Units' .	33,074	35,518	+ 7	36,456	39,632	+ 9
'Pasture Units' per 'Cow Unit' . . .	1·37	1·38	..	1·56	1·75	..
Lambs per hundred ewes	96	93	− 3	95	95	..

Selkirk shows an insignificant decline in carrying capacity—1·38 as against 1·37 'pasture units' to each 'cow unit.' There is also a slight fall—from 96 to 93—in the lambing percentage. In Peebles live stock numbers have failed to keep pace with the increase in the grazed area, each cow unit requiring 1·75 pasture units in the latter period as against 1·56 in the earlier. The lambing percentage shows no change. In both these counties there has been some change from Cheviot to Blackface sheep; on the other hand, the quality of the Blackfaces, and also of the cattle, has certainly improved. Upon the whole, then, there is no clear evidence either of improvement or of deterioration in the grassland output as a whole.

TABLE III.—PASTURE AREAS AND LIVE STOCK NUMBERS, INVERNESS AND ARGYLESHIRE.

	INVERNESS.			ARGYLL.		
	1893-95.	1933-35.	Percentage Change	1893-95.	1933-35.	Percentage Change
Grassland (Acres)—						
Mountain and Heath	1,635,780	1,654,049	+ 1	1,466,367	1,527,104	+ 4
Permanent Pasture	57,838	55,349	− 4	61,128	49,016	−20
Temporary Pasture	18,801	22,155	+ 18	16,260	13,797	−20
Total Pasture Units	403,895	408,314	+ 1	370,661	367,453	− 1
Live Stock Numbers—						
Cows and Heifers in Milk or in Calf	21,620	20,289	− 6	22,597	20,749	− 9
Other Cattle	31,213	24,135	−23	38,635	30,296	−22
Breeding Ewes	265,464	234,485	−12	405,235	343,054	−15
Lambs	200,426	171,987	−14	322,634	258,494	−20
Other Sheep	187,964	77,324	−58	305,709	111,035	−64
Total Carrying Capacity as 'Cow Units'	157,041	123,406	−21	227,944	168,754	−26
'Pasture Units' per 'Cow Unit'	2·57	3·31	..	1·62	2·18	..
Lambs per hundred ewes	76	73	− 3	80	75	− 5

Table III., for Inverness and Argyllshire, shows a different picture. In both cases the area of grazing has been nearly maintained, while there has been a decline in the number of every class of live stock. The calculated total decline is twenty-one per cent in the former county and twenty-six per cent in the latter. Even if we allow for the fact that there is nowadays some deliberate understocking (in order to improve sporting rents) the decline in live stock numbers must imply far-reaching deterioration of the grazings. The fall in the lambing percentage goes to confirm this conclusion.

A variety of recent developments have combined to improve the prospects of profits from grassland improvement. It has been known for a century that the commonest of all the causes of pasture deterioration is the depletion of the phosphate reserves in the soil, and that regular doses of phosphate are necessary to the maintenance of the output of most grassland. The cost of phosphatic manures is therefore an important matter. The cheapest source of phosphate is ground mineral phosphate, and recent experiments have shown that this gives excellent results on many Scottish soils, though not on all. Where the more expensive high-soluble slag must be used there is now the twenty-five per cent Government subsidy.

Again, much land in Scotland is by nature sour. It was originally reclaimed from moor by the use of heavy dressings of lime, and must return again to moor unless the constant wastage of lime is made good. During the past half-century the application of lime on the poorer sorts of land has often been uneconomic, but a fifty per cent subsidy creates the possibility of profit.

Another relevant consideration is that poor and rough grassland is very costly to break up by horse implements, but can be dealt with more cheaply by tractor power. Breaking up and resowing is often by far the best way to improve grass, and the tractor is a definitely valuable asset for this purpose.

Again, the use of pedigree indigenous strains of grasses promises to be profitable for longer leys on poor land, and especially in reseeding, to permanent grass, land that has been broken up out of worn-out pasture.

Finally, the new scale of Cattle Payments gives extra encouragement to the producer of high quality store cattle. This is an inducement not only to increase the stock-carrying capacity of the land, but to readjust the balance between the numbers of cattle and sheep. In certain cases the tendency to increase sheep at the expense of cattle has had something to do with the deterioration of grazings, and a restoration of the balance would tend to improve the herbage and raise the output.

These major points, together with a number of minor or incidental matters, are considered in what follows.

Phosphatic Fertilisers.

Land may be seriously deficient in phosphoric acid and may yet continue to produce quite abundant grass of a sort. Dressings of phosphate may fail to increase the quantity of herbage, the change that they bring about being mainly or wholly in quality. The point is well illustrated by certain figures from Cockle Park. The old Tree Field contains one plot which has received no fertiliser for forty years (and probably for a much longer period), and another which has had a dressing of five hundredweight of basic slag every third year since 1897. In 1930 and again in 1934 the plots were sampled, the yields of dry matter were estimated, and the herbage was analysed. The live-weight increases of the grazing sheep (ewes and lambs) were, of course, determined as usual. The average figures for the two years were as follows :—

	Plot 6. (Unmanured).	Plot 4. (Basic Slag)
Total Yield of Dry Matter per acre .	3963	3628
Percentage Composition of Dry Matter—		
Crude Protein	8·5	14·2
Phosphoric Acid (P_2O_5) . .	0·37	0·91
Lime (CaO)	0·62	0·93
Live-weight Increase of Sheep per acre	71·3	202·4

Thus the rather smaller quantity of grass from the slagged plots gave nearly three times as great live-weight gains as the rather bulkier growth from the unmanured plots. It follows that it must be a matter of some difficulty to estimate the amount of benefit that is obtained from phosphatic dressings, or to compare the effects of different kinds of phosphates. The mere weighing of hay crops or of short-grass clippings will clearly be of little use, and a grazing trial, carried out over a number of seasons, is too laborious an affair for the ordinary farmer. In practice, of course, the effects of phosphatic dressings—the richer green colour and the more abundant growth of wild white clover—are often clearly visible to the eye. But improvement can be very real without being very obvious.

A relatively new method of measuring the response to phosphate is to weigh the herbage from sample plots, and to analyse this for phosphoric acid, over a period of three or four years. It is then possible to calculate what proportion of the applied phosphate has been recovered in the herbage that a grazing animal would have eaten. It is a fairly safe assumption that the improvement in feeding value will be in proportion to the amount of phosphate that the plants have actually taken up from the soil. This proportion is never very high, rarely exceeding twenty-five per cent of the amount applied. The remainder of the phosphate seems to be firmly fixed or locked up in the soil, and becomes available only over a long period of years.

This method has thrown light on the relative efficiency of different forms of phosphate on different types of soil. It has long been known that the more easily soluble forms (superphosphate, basic slag (of high citric solubility) and bone-flour) give very reliable results over a wide range of soils. Where one or other of these fails to give a response on poor grass, some factor other than phosphate deficiency must be suspected—*e.g.*, a shortage of potash or lime, or a lack of drainage. On the other hand, fertilisers of low solubility—ground mineral phosphate and low-soluble slags—have given extremely variable results. It is well known, for instance, that these are generally valueless on the chalk and limestone soils in the south-east of England, whereas they generally give excellent results on rather acid soils in the south-west of Scotland. The importance of soil acidity in relation to the effectiveness of ground mineral phosphate is well illustrated by the following figures collected by Dr E. M. Crowther.[1] Soil acidity is now measured by chemists on a scale (pH scale) upon which the figure 7 represents neutrality, 8 a moderate degree of alkalinity, and 6, 5, and 4 increasing degrees of acidity.[2] It does not follow that a moderate degree of acidity indicates a need for lime, because only a small number of plants (such as lucerne and sainfoin) actually thrive best on neutral or alkaline soils. A large range of crops, including most of the better grasses and clovers, will grow well on soils with a pH as low as about 5·5. In Table IV. the soils

TABLE IV.—PERCENTAGE RECOVERY OF PHOSPHORIC ACID IN HAY (3-4 YEARS).

	Low-Soluble Slag.	Gafsa Mineral Phosphate.	High-Soluble Slag.	Super-Phosphate.
Four Alkaline and Neutral Soils (pH 7·1 – 7·8)	3	3	17	17
	2	4	13	16
	8	8	34	30
	6	8	26	30
Average .	4·8	5·8	22·5	23·3
Five Acid Soils (pH 4·9 – 5·2)	3	10	7	8
	5	16	18	21
	6	13	13	15
	10	19	14	18
	6	29	31	32
Average .	6·0	17·4	16·6	18·8

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[1] 'Journal of the Royal Agricultural Society of England,' Vol. 95, 1934.

[2] See Prof. Hendrick, 'Highland and Agricultural Society Transactions,' 1935 p. 34.

are classified into two groups only, one group being neutral or alkaline and the other rather acid.

Broadly speaking, it may be said that mineral phosphate is much less readily available than high-soluble slag or superphosphate on neutral soils, but equally available under acid conditions.

It is a very easy matter to determine the acidity of any soil, and hence to predict with fair certainty whether mineral phosphate will prove effective. Even with the twenty-five per cent subsidy upon basic slag, ground mineral phosphate remains the cheaper source of phosphate, and should be preferred wherever the conditions suit it. It seems that the rainfall of the area may have some bearing on the choice, high-soluble slag being rather quicker acting than mineral phosphate (other things being equal) in dry districts. On the other hand, where the cost of application is heavy (*e.g.*, on mountain land) the mineral phosphate has the advantage that it is more concentrated; six hundredweight of mineral phosphate supplies the same amount of phosphoric acid as half a ton of an ordinary grade of slag.

It is well known that the efficiency of such fertilisers as are insoluble in pure water (basic slag, mineral phosphate, and ground limestone) depends on their fineness of grinding, and that they should be bought only with a guarantee of fineness. It should also, however, be realised that the advantage of fine division can be partly lost if care is not taken in their application. If such materials are distributed during rain, or on very wet or snow-covered ground, the fine particles cling together in lumps which are much less easily dissolved than the original powder.

POTASH AND NITROGEN.

The grazing animal removes from the soil only very small quantities of potash, so that the need for potash fertilisers on pastures is not universal. Deficiency, however, is common, and in certain districts almost the rule. It is impossible to predict with certainty whether or not potash will give a response on any given field, but a fair guess can be made if all the circumstances of the case are considered. Firstly, soils derived from sandstones and chalks are much more likely to be deficient than those formed from granite or other primary rocks. Secondly, a light soil on a sandy or gravelly subsoil loses, in the long-run, a good deal of potash by leaching. A heavy soil on a clay or till subsoil suffers much smaller losses from this cause. Thirdly, the selling of potatoes, sugar beet, or hay involves a heavy drain on the available potash of the soil, and soon leads to deficiency unless the loss is made good by manuring. Finally, when grass is being sown, the time that has elapsed since the most recent application of dung should be considered. The longer that the land has been without dung the more likely is it to be short of available potash. It is, however, advisable, in the absence of actual experience of the land, to test the state of the soil in regard to potash. A number of laboratory and pot-culture methods have been devised, and most colleges and advisory centres are in a position to carry out one or other of these. If such a test fails to give a definite answer, there is no recourse but to try a simple experiment in the field—*e.g.*, to apply two hundredweight per acre of thirty per cent potash salts to one or two 'rigs' in each of the fields with which the farmer is concerned.

With regard to nitrogen, it is true that a full growth of the better grasses can be obtained only when they are well supplied with this element; but the cheapest method of maintaining the supply is to preserve a proper balance between the clovers and the grasses in the sward. It has long been known that the clovers, in the presence of the proper strains of nodule-forming bacteria, assimilate nitrogen from the air, and that some of this nitrogen is ultimately handed on to the grasses. Until lately it was believed that the grasses obtained this nitrogen only when the clover roots had died and decayed, but it has lately been shown that the living and active clover roots give out into the soil certain nitrogenous compounds which, under warm soil conditions, are quickly nitrified and thus made available to the grasses. If clover is abundant and vigorous, therefore, the grasses will get enough nitrogen, except during a short period in the early spring, when the clovers are still inactive. The failure to keep a proper proportion of wild white clover in a sward may be due to one or more of a number of causes. A shortage of phosphate is the commonest. Next, the clover will fail to grow vigorously if the land be too sour, a point that is dealt with below. Thirdly, white clover is a prostrate plant that likes the sun, and is, therefore, quickly suppressed by the taller-growing grasses if a pasture is undergrazed. This point is also discussed below. Finally, Rothamsted workers have lately shown that there is a great variety of strains of the bacteria that form the root nodules on white clover, and that some of these are highly efficient while others are practically useless. In certain Welsh mountain soils the prevalent strains of organisms are these worthless ones, and it seems that good 'takes' of wild white clover under such conditions may depend upon the inoculation of the seed with an artificial culture of a good strain. The case is parallel to that of lucerne, in the establishment of which crop artificial inoculation of the seed is often of great value.

The main use of nitrogenous fertilisers, on ordinary pastures, is to induce early spring growth, but it is important to observe that success in this can be obtained only under certain conditions. Of the plants ordinarily included in grass-seed mixtures the only ones that can be forced into early growth are Italian and perennial ryegrasses and cocksfoot. A pasture which is to produce an 'early bite' must therefore have a goodly proportion of some of these; moreover, the plants must have good reserves of food stored up in their roots and leaf sheaths, and to secure this condition the pasture must be rested, or only lightly grazed, during the previous autumn and winter. If a nitrogenous top dressing is applied, in February or March, to land in such a state, early keep—perhaps a fortnight in advance of the usual time—may be expected in a majority of years. The exceptions occur when the early spring is very cold and when there is a sudden change to warm, growing conditions. In such cases the 'early bite' fails to materialise, or comes only a few days in advance of the growth on the untreated fields.

It is sometimes suggested that such application of nitrogen to pastures leads to the suppression of wild white clover, and in the end does more harm than good. Such a result will indeed follow if the 'early bite' is grown and not grazed, for the grasses, stimulated into early growth, will tend to overtop and smother out the later-starting clover. But hard spring grazing will maintain the balance; this weakens the grasses and gives the clover its chance; in fact, if an early bite is fully utilised by heavy spring grazing the proportion of clover will usually increase rather than decline in the following season.

One more point must be mentioned in connection with nitrogen. The best grasses are more productive of keep than wild white clover, and give a better distribution of keep throughout the year. Moreover, if they are closely enough grazed to prevent the suppression of clover they give less than the maximum production of which they are capable. It is therefore possible to obtain a higher output of food from a grassy sward, under rotational grazing and heavy nitrogen manuring, than from a closely grazed clovery sward. The case of a timothy meadow, heavily dosed with nitrate and containing little or no clover, illustrates the point; the total food value that such a meadow produces is generally much larger than a wild white clover pasture on the same land would yield. The argument for using wild white clover to feed the grass with nitrogen is simply that this is a much cheaper, if somewhat less efficient, method than the application of nitrogenous artificials; and that on ordinary land, and at present price levels for live stock products, it is generally more profitable. But if prices for milk and meat should rise, or those of artificial manures fall, there would be a case, in certain areas at least, for an all-grass sward, heavily manured with nitrogen and rotationally grazed.

Soil Reaction and Lime.

Most Scottish soils are more or less acid, and many of them require periodical dressings of lime if they are to bear either satisfactory arable crops or good pastures. It is, however, necessary to regulate carefully the amounts of lime that are applied.

In these 'Transactions' for 1935 (page 48) Professor Hendrick gives a diagram showing the relation of soil reaction, in terms of the pH scale, to the growth of the commoner Scottish crops. The diagram shows that, with the possible exceptions of sugar beet and peas, all these crops find the conditions that they like within the range of 5·5-6·2 on the scale. If the pH is much below 5·5 barley and red clover may fail; on the other hand, oats, swedes, and potatoes give less satisfactory results if the figure is above 6·2. Land in ordinary rotation should therefore be maintained at a level of acidity between the two figures.

So far as grassland is concerned there seems to be no advantage in aiming at a figure much above the minimum of 5·5 or 5·6, and it is cheaper to maintain the reaction at this figure than at one nearer to neutral. The wastage of lime in drainage water is an important consideration, and the rate of wastage is always lower from acid than from neutral soils. The annual loss from a soil containing a good deal of free lime (like that at Rothamsted) may amount to four hundredweight per acre; while at the level indicated above the loss may be less than half this amount.

The determination of the pH figure does not in itself indicate the *quantity* of lime that is required; on peats and clays a large amount of lime is required to change the reaction by a given amount, while a much smaller dressing on sandy land will produce the same effect. There are, however, methods of estimating the quantity of lime that the soil requires, and the advice of the advisory chemists of the colleges should always be sought before heavy applications are made.

Seeds Mixtures.

Commercial, Indigenous, and Pedigree Strains.

The valuable species of grasses, such as ryegrass, cocksfoot, and timothy, are all highly variable in growth form, earliness, tillering capacity, and other characters. Moreover, they are all wind-pollinated, so that individual plants are of very mixed breeding, and there is usually very marked variation among the seedlings from a single mother plant. Most of the grasses are partially or completely self-sterile—*i.e.*, a plant will fail to set seed in the absence of pollen from another plant.

If we grow such a mixture of types on a particular soil and subject them to a particular system of treatment, those types that are best adapted to the conditions will survive and spread, while those less well adapted will be largely suppressed. Thus the general type of ryegrass found in a Romney Marsh (Kent) pasture is one well suited to survive on a damp soil and under very hard grazing with sheep. If we harvest and sow seed that has been collected from such a pasture we shall get a preponderance of these same types, but we must remember that the parent plants are mixed and that none of them breed true. If from this sown crop we take 'once grown' seed in the first year, we shall unintentionally select from the mixture of types those that make the quickest early growth, and that run to seed the soonest. Thus 'once grown Kentish ryegrass' may be substantially different from 'Kentish Indigenous,' harvested direct from the old pasture.

Where this process is repeated through many generations, and a so-called 'commercial' strain is thus produced, this latter will be composed of relatively stemmy, free-seeding forms. These usually tiller rather poorly, tend to exhaust themselves by running to seed, and are less persistent than the indigenous types. It must be remembered that the sown grasses are always more or less subject to the competition of unsown indigenous grasses and weeds, and that the cleanness of the sward after a few years will largely depend on the powers of competition of the sown grass.

This last point is illustrated by the results of a Dutch experiment quoted by C. K. Van Daalen at the International Grassland Congress last summer. Plots were sown with mixtures of perennial ryegrass and wild white clover under conditions where unsown rough-stalked meadow-grass (there regarded as an inferior species) was known to compete very strongly with the plants sown. Various strains of ryegrass were used for the different plots; these included one plot with an ordinary commercial type, one with Kentish indigenous seed, and a third with indigenous seed from a local Dutch permanent pasture. The commercial strain made the most vigorous start and showed the best sward at the end of the year of sowing (1933). Three years later, however, the percentages of ryegrass in the three plots were as follows:—

'Commercial'	14
Kent Indigenous	28
Dutch Indigenous	64

Equally striking results have been obtained in this country. For instance, a trial was laid out by Aberystwyth workers between mixtures containing respectively commercial and indigenous strains of ryegrass and cocksfoot. Counts of the numbers of ryegrass and cocksfoot tillers were made year by year, the sward being hard grazed throughout the period of the trial. In the fourth year of the ley the 'indigenous' plot showed twice as many tillers of ryegrass and five times as many of cocksfoot as the 'commercial' plot.

A further important step of progress has been to subject to continuous and careful selection the mixture of types of a given species obtained from old pastures. By this process numbers of 'pedigree indigenous' strains have been developed, and some of these are already on the market. Selection has been based on general vigour and leafiness, and on the characters required for special purposes. Thus there are hay, pasture, and dual-purpose strains. Numbers of seedsmen are now offering seeds of certain of these strains, and it is a matter of importance for the farmer to decide how far he will make use of them in compounding his seeds mixtures. The considerations which should guide his choice may therefore be shortly set out.

Firstly, the indigenous and pedigree strains are more persistent under hard grazing, and have greater powers of competition with other plants, than commercial strains. Their use will tend to prevent the intrusion of weeds such as Yorkshire fog, bent, and daisies during the later years of the ley, and will check the over-development of wild white clover, which is a fairly common difficulty with the mixtures now in general use. On the other hand, the commercial strains are more productive in the first year—particularly in hay—so that the advantage of the indigenous strains in the later years must be balanced against their lower yields in the earlier.

In general, again, the indigenous strains at present available are late types. They give more keep in late summer and autumn, but less in early spring, than ordinary commercial strains. It seems, however, that lateness is not necessarily associated with leafiness and persistence, and, indeed, early pedigree strains (such as S.24 ryegrass) may shortly come on the market.

The pedigree strains produce a larger proportion of leaf, and have less tendency to run to seed, than the commercial. Their use, therefore, makes for easier management of the grazing. Rather unexpectedly, however, it has been found that when stock are offered the choice of the two types they will sometimes prefer the commercial strains. This may possibly be connected with the earliness of the latter, the stock concentrating on the commercial plots in spring and neglecting the others; the plot that has been grazed early may then remain more attractive at a later stage. It is always, however, somewhat dangerous to draw conclusions about the relative values of different grasses according to the behaviour towards them of animals that are offered free choice.

Finally, there is the important consideration that the pedigree seed is meantime expensive. S.23 ryegrass, for instance, was offered in this year's catalogues at prices about three times as high as those for ordinary commercial seed. This difficulty is probably in some measure insuperable, because it is the natural habit and the special merit of the pedigree strains that they are shy seeders. It seems, however, that they may be persuaded to seed more freely by special treatment—by sowing them in widely spaced rows and by carefully balanced manuring. The disparity in prices will very probably become less as the technique of seed production becomes better understood.

The usefulness of indigenous strains will no doubt be found to vary from one district to another, and no precise recommendations can safely be made until more trials have been carried out. The following statements, however, seem to be true as far as they go :—

(1) In two years' leys indigenous and pedigree strains show no balance of advantage, and the extra expense of a mixture containing their seeds would not be recovered.

(2) The use of these strains will produce an improvement in third year's grass under most conditions; but it is doubtful whether, at present price levels, the improvement would be enough to cover the additional cost of the seed. A substantial fall in the price of the pedigree seeds would probably make their use profitable on many farms in laying down three-year leys. The farmer, however, must be guided by his experience of the behaviour of ordinary commercial strains under his local conditions. If these usually weaken or die out in the third year, allowing Yorkshire fog or other poor species to come in, then the expense of pedigree indigenous seeds may well be justified.

(3) Where grass is intended to lie for four years the replacement of perhaps one-third of the commercial seed by indigenous seed or pedigree strains is likely to pay. For still longer leys this proportion may profitably be raised.

(4) Where poor land is being ploughed out and reseeded to permanent grass, the use of a high proportion of indigenous seed is essential to success.

In the meantime the question of choice of strain is important only in respect to perennial ryegrass and cocksfoot.

Of ryegrasses the pedigree strain S.23, bred at the Welsh Plant-Breeding Station, must be given first place. It has the merits of leafiness and persistence in high degree, and is relatively very true to type. It is a late variety and, therefore, very suitable for blending with the early commercial types. An otherwise similar type, which is early (S.24), is not yet available in quantity, but may probably be useful for very long leys and permanent pastures in providing spring keep after the commercial type has died out of the sward.

Kentish indigenous, harvested direct from old pastures, is, of course, a complex mixture of forms and probably a good deal less productive than a good pedigree strain. The mixture is, however, on the whole, leafy and persistent, and the seed is meantime available at about half the price of that of S.23. It has already been mentioned that 'once grown' Kentish seed is rather different from, and probably a good deal less useful than, the original produce of an old pasture. It is doubtful whether any of the other strains of ryegrass are superior to the Ayrshire commercial type.

Among cocksfoots, two Aberystwyth strains are available. The better known of these, S.26, is a dual-purpose type (suitable, that is to say, for either hay or pasture), and is markedly more leafy and persistent than the commercial types. It is again late. The other, S.143, is an extreme pasture type, producing a very dense and leafy sward. It shows very little trace of the faults for which the commercial strains are notorious—*i.e.*, it does not form coarse tufts or run to hard, wiry stems.

Next in order of merit for long leys and permanent grass is New Zealand Akaroa, which again is a mixed strain harvested from old pastures. It has given good results in this country, but the supply of seed is limited and irregular from year to year. In 1938 practically none was available. Swedish late-flowering is a useful late strain, but probably less well adapted to our climate than Akaroa. Of the commercial forms, the most extreme is Danish. A proportion of this in a mixture is useful on account of its earliness, but it is easily killed by hard grazing and becomes very tufted and stemmy if the grazing is too light. It is thus very difficult to manage.

If full advantage is to be secured from the use of indigenous strains it is necessary to nurse the sward in its early stages with some care. It is well known that any grass or clover is liable to be weakened and suppressed when it is grown in mixture with a taller, earlier maturing, and leafy type of plant. Many examples might be given. A late ripening and leafy variety of oats (*e.g.*, Sandy) makes a bad nurse crop for grass seeds, more especially in late districts. A stiff strawed, less leafy, early, 'grain-producing' type (*e.g.*, Yielder) is much better. Even with such a variety it is good for the grass if the corn can be cut before it is fully ripe. Similarly in a hay crop (and especially if it is cut late) Italian ryegrass and red clover tend to smother out perennial ryegrass and wild white clover. Commercial perennial ryegrass, in turn, very effectively suppresses meadow fescue if the first year's grass is laid up for hay.

The indigenous types which are best suited to grazing are rather low-growing or semi-prostrate in habit, and are ill-suited to compete in a hay crop with commercial perennial ryegrass and red clover. The use of a ley for one year's hay and two or three years' pasture does not, therefore, give them their best chance. On the other hand, if the first year's grass is grazed they quickly form a good sward even in the presence of strong and tall species like Italian ryegrass. Professor Stapledon has suggested that, since good hay types and good pasture types of grasses are essentially different, it might be worth while to use different grass-seed mixtures for the two purposes. For example, instead of running the grass in each round of cropping as one year's hay and two years' grazing, a given field might be laid down with a two years' hay mixture in one round, and with a four years' pasture mixture in the next. The disadvantage of such a scheme would be that the land would get an overdose of fertility in the latter case, and would be none the better for the two successive crops of hay. However this may be in the case of rotation grass, it is certain that when land is being sown with indigenous seeds, with the idea of making a permanent or semi-permanent pasture, there is a strong argument against cutting hay in the first year.

THE CONTROL OF GRAZING.

The grazing animal affects the growth of the plants in a pasture in several distinct ways, and these effects vary with the particular sort of animal in question.

Speaking generally, the more severe the grazing—that is, the oftener and the more closely that the plant is eaten down—the lower is the yield of dry substance from the grass, but the higher is its digestibility and nutritive value. This effect can be studied by itself—that is to say, apart from the effects of the treading and manuring that are necessarily associated with actual grazing—by mowing the herbage closely (say to an inch from the ground level) at varying intervals of time throughout the growing season.

In one such series of experiments carried out by Woodman, the yields of dry matter per acre varied, according to the frequency of cutting, as follows:—

Frequency of Cut	Dry Matter per acre.
	cwt
Weekly (April to October)	17½
Fortnightly (April to October) . . .	23
Three weekly (April to October) . . .	29
Hay (June) and Aftermath (October) . .	59

The protein content of the herbage declines as the period between cuts is extended. Thus the dry matter of herbage cut at weekly intervals will generally contain over twenty per cent of total crude protein; cut at the hay stage the figure falls to about eight per cent. The digestibility of the protein also declines as the herbage gets older. The change in starch equivalent is in the same direction but of less amount—from about seventy per cent of the dry matter in very young herbage to about forty at the ordinary hay stage.

If quality and quantity are considered together it will be clear from these figures that the total yield of digestible nutrients can be seriously depressed by continuous very close grazing. The amount of sugar that is manufactured by the plant depends on the area of its leaf surface that is exposed to the light, and continual severe grazing keeps this leaf area very small. Moreover, hard grazing, or close and frequent cutting, makes for a shallow and weak root system and renders the plant much more susceptible to drought. It is a familiar observation that a very bare pasture will stop growing altogether in a dry time, while a more leniently treated sward will continue to make growth.

The maximum yield of digestible protein per acre is obtained from fairly short-grazed pasture—corresponding to a sward that is cut at intervals of three or four weeks under average growing conditions. At this stage the herbage is of sufficiently high digestibility for high-producing animals—*e.g.*, cows yielding three or four gallons of milk per day or fattening lambs.

The maximum yield of starch equivalent per acre is, on the other hand, generally obtained by cutting at the hay stage and taking only two cuts in the season. Where a highly concentrated food is not required—*e.g.*, for wintering store cattle or feeding dry cows—a given area of land cut twice in the season will maintain a substantially larger head of stock than the same area cut over five or six times, assuming that the produce in both cases is preserved with the same proportion of loss.

The effect of close grazing or hard cutting varies according to the growth habit of the plant. Thus, wild white clover, being prostrate and low growing, is not easily damaged. At the other extreme a very erect-growing plant that makes little 'bottom' growth (*e.g.*, tall oat-grass) quickly dies out altogether. Considerable differences also obtain between different strains of the same grass. A prostrate, leafy, free tillering cocksfoot such as S.143 will survive where an erect stemmy form like Danish will be quickly exterminated.

Martin Jones has shown that the proportions of different species in a sward can be very rapidly altered by the seasonal control of grazing. The principles may be illustrated by considering the type of sward produced in the second or third year of a ley by the use of the type of grass-seed mixture that is commonly used at present. The three main constituents will be commercial perennial ryegrass, commercial cocksfoot, and wild white clover.

Of these the ryegrass gives the nearest approach to all-the-year-round growth. It continues to grow in late autumn, remains relatively green in winter, and makes, or tries to make, growth in the very early spring. At these seasons both the cocksfoot and the clover are dormant—*i.e.*, are offering no living leafage to the grazing animal. Resting a pasture between October and May will therefore create a vigorous plant of ryegrass. Continuous grazing at these periods will weaken the plant, so that it is in a poor condition to compete with the cocksfoot and clover.

Commercial cocksfoot has the natural habit of laying up large reserves of food in its roots and leaf bases in late summer and early autumn. The leafage is killed ('winter-burnt') by the first frost, and the plant remains dormant until mild weather arrives in spring. It then comes away with a great rush of growth. If a pasture be heavily stocked in August and again in May the cocksfoot will therefore be suppressed. If stocking is light at these times the cocksfoot will grow rank and tall, overshadowing and suppressing both the ryegrass and clover.

Wild white clover starts into growth only late in spring. It is very sensitive to the shade thrown by plants of taller habit, such as cocksfoot and (in less degree) ryegrass; the growth which it makes will then depend on the amount and the vigour of the grasses with which it has to compete. Hence the fact that, if a pasture be closely grazed from August to May inclusive, it will tend to run to a very clovery sward in the following summer. On the other hand, a complete winter and spring rest will produce a very grassy sward. It follows that the proper balance between grass and clover can be attained only through a proper balance between the amount of stock which the pasture is asked to carry at the different seasons of the year. Too large a head of sheep and outwintered cattle, particularly the former, will always tend towards the production of a too-clovery sward.

A proper balance between sheep and cattle is important for other reasons that are not fully understood. At Cockle Park there are two adjoining fields with the same type of soil which originally carried the same type of sward. Both are under manurial experiments. In each field there is a plot which receives a dressing of five cwt. of basic slag every third year. But the one (Tree Field) is stocked with sheep only—since 1930 with ewes and lambs. The corresponding plot on the other field (Hanging Leaves) carries a mixed stock of ewes, lambs, and cattle. For the past seven years the average live-weight increase produced by the sheep on the Tree Field plot (during the summer grazing period) has been 202 lb. per acre, while the total live-weight gain of the mixed stock on the corresponding Hanging Leaves plot has been 260 lb. per acre. Still more striking is the better progress made by the individual lambs which run with the cattle. These have made an average gain per head of 54 lb. in the season, against only 40 lb. for those running on the plot which is grazed by sheep alone.

There has been no similar experiment on hill land, but there is very strong evidence for the view that the deterioration of much of our hill land has come about through the attempt to replace the old mixture of sheep and cattle with sheep alone. The spread of bracken and the increase of *Nardus* and *Molinia* seem to be partly explained by the fact that sheep avoid these plants, while cattle do not.

THE REMAKING OF POOR PASTURE.

Professor Stapledon and his staff at Aberystwyth have carried out a number of very valuable experiments on the improvement of the poorer types of pasture. It is impossible here to review the whole of this work, and attention will be confined to one question—that of the quickest method of obtaining the maximum improvement.

It has already been pointed out that the value of a pasture depends in part on the quantity of grass that it produces, but even more upon the nutritive value of the herbage. It has also been pointed out that three analytical figures, taken together, give a very useful indication of nutritive value—the percentages of protein, phosphoric acid, and lime in the dry matter.

Professor Fagan of Aberystwyth has carried out very large numbers of analyses of pasture herbage and has arranged the different pastures in grades according to their value. Average figures for his five grades are as follows :—

Grade.	I.	II.	III.	IV.	V.
Dominant Species.	Ryegrass : Wild White Clover.	Bent (*Agrostis*) : Ryegrass : Wild White Clover	Bent (*Agrostis*) : Yorkshire Fog : Wild White Clover	Bent (*Agrostis*) : Sheep's Fescue	Flying Bent (*Molinia*) : White Bent (*Nardus*).
Percentage in Herbage—					
Protein .	21·6	18·2	15·1	12·4	9·8
Phosphoric Acid (P_2O_5)	0·94	0·76	0·59	0·44	0·26
Lime (CaO)	1·26	1·12	0·81	0·39	0·32

If, now, we take one of the lower grades of these pastures and proceed to improve it, the first step must be to provide the soil conditions under which the better species will grow and thrive. This will almost certainly necessitate a heavy dressing of phosphate and possibly of lime as well. But this alone will not be sufficient. The poorer species will be in firm possession of the ground, and the better, even if they are present in small amount, will have a long and hard struggle against them. Some good will always be done by ensuring fairer conditions for the fight—*e.g.*, by burning off the old herbage, by tearing up some soil, and by hard grazing. But if the proportion of good plants in the sward is very small these methods will produce only a slow and partial change. To get maximum results, seeds of some of the better species must be sown, and the seedlings must be freed from the competition of the old poor plants.

The following figures, also put together by Professor Fagan, show the average results obtained in the improvement of Grade IV. (Fescue-*Agrostis*) pastures by manuring alone,

	Dry Matter.	Protein.	Phosphoric Acid (P_2O_5).	Lime (CaO).
(1) Untreated . . .	100	100	100	100
(2) Manuring only . .	151	165	266	208
(3) Manuring and Cultivation . . .	178	182	304	265
(4) Manuring, Cultivation, and Seeding . .	243	310	403	529

by manuring and some form of cultivation together, and by a combination manure, tillage, and seed. In each case the output of the untreated plot is given as 100, and those of the treated plots in proportion.

The plots receiving the complete treatment yielded nearly two and a half times as much dry matter, fully three times as much protein, and four or five times as much minerals as the untreated. The partial treatments showed marked results, but these fell far short of those obtained when all three measures were combined.

Of the various tillage implements that may be used, the plough is the most satisfactory and should be preferred where ploughing is feasible. The season for ploughing is a matter of comparative indifference, and the work may be done when other tasks are not pressing. In Wales numbers of contractors are prepared to take on the work, and since they can afford suitable equipment it is often convenient to have the work done by them. At Cahn Hill the most satisfactory equipment is a track-laying tractor with a 'Junotrac' plough. If steep slopes have to be negotiated, specially wide tracks are a great advantage.

As regards manures, a really heavy dressing of high-soluble slag, or ground mineral phosphate, will almost invariably be required. Not less than fifteen cwt. per acre of the former or ten cwt. of the latter is likely to suffice on very poor land. The ground mineral phosphate may actually be preferable. Lime may often be required, and a light dressing of nitro chalk at seeding is a great help in ensuring a 'take.'

Seeds mixtures must be made up with due regard to the difficult conditions under which the grasses will have to live. In general the commercial strains of the better grasses cannot be expected to persist. Indigenous ryegrass and wild white clover, blended with some wild white clover cleanings, make a useful combination. The latter usually contain a good many small seeds of ryegrass and wild white clover, with crested dogstail, ribgrass, and other things in smaller proportions.

The order of operations is again a matter of some importance. If there is a heavy growth of dead grass, and a 'mat,' a preliminary burning will be a great help. The mineral phosphate or slag may next be applied and worked into the land by harrows. These operations may with advantage be carried out a year or more before ploughing up, since the phosphates take some time to become available.

The next operation should be ploughing, a wide furrow being cut and turned over as near as possible on its back. A period of a month or two should be allowed to elapse between ploughing and sowing, the land in the meanwhile being limed and the lime worked into the surface. A disc harrow is a valuable tool for this purpose and for making a tilth for the seed, as it consolidates and does not tear or turn over the furrow slice. The nitro chalk is then applied and the seed sown.

After a good many trials of nurse crops Professor Stapledon is inclined to prefer nothing but a few pounds of Italian ryegrass, sheep being turned on to consume this, and to tread the land, as soon as there is anything to graze. Many of his plots have been grazed within eight or ten weeks from sowing, and have produced a considerable amount of keep in the year of sowing.

Naturally the cost of the whole operation must be carefully considered in relation to the amount of improvement that is likely to be achieved. Costs will vary, particularly according to the ease or difficulty of tillage and according to the quantity of lime that may be required. Returns will vary according to the level of productivity that the improved grass is likely to maintain. The prospect of profit is greatest where there is a reasonable depth of soil, and where the elevation is comparatively low—say not more than 1000 or 1200 feet above sea-level. But it seems that there is a good deal of land where the whole cost would not exceed five or six pounds an acre, and where the annual value of the grazing might be increased by ten shillings an acre.

FURTHER RESULTS FROM THE CRAIBSTONE DRAIN GAUGES.

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IN previous papers in the 'Transactions' results obtained from the Craibstone Drain Gauges have been recorded. The first paper[1] gave an account of the construction of these drain gauges, or lysimeters, and of the preliminary results obtained from them. The next paper, published in 1930,[2] dealt with the results obtained during the first ten years of cropping, and gave a balance-sheet of all that was added to the soil during the first rotation and all that was removed from the soil in the crops and in the drainage. In this period lysimeters II. and III. were manured and III. was limed in addition. The first rotation was the ordinary six-year rotation of the district, turnips, then oats followed by three years of grass, and finally oats. The next rotation was modified and lengthened to eight years, in four of which the crop was grass, after which a crop of potatoes was taken, and then oats. This was done for two reasons: (1) to test the effect of the intensive manuring of grass; (2) it was found in the first rotation that the grain crop after three years' grass was very heavy although the grass was not intensively manured, so potatoes were taken after four years' grass in the second rotation to reduce the condition of the land. An account of the very interesting results obtained from the intensive manuring of the grass on lysimeters II. and III., as compared with those obtained from No. I. which is continuously unmanured, was given in two papers published in 1932[3] and 1934.[4] In the present paper we propose to deal with the general results obtained from 1927, when the second rotation started, to 1936.

The Craibstone Drain Gauges are three in number, Nos. I., II., and III., each one-thousandth of an acre in area. They consist of blocks of natural soil 40 inches deep enclosed in watertight containers made of Caithness slate. The method of their construction, and the details of the soil enclosed in them, were given in the 1921 paper. Any water which flows through them can be collected below, and it is systematically measured and analysed so as to find all that is being washed from the soil in drainage.

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[1] "The Measurement of Soil Drainage, with an Account of the Craibstone Drain Gauges." 'Transactions,' 1921, pp. 56-79.

[2] "A Soil Balance-sheet for a Rotation. Results obtained from the Craibstone Drain Gauges." 'Transactions,' 1930, pp. 1-27.

[3] "Intensive Manuring of Grassland. Results obtained from the Craibstone Drain Gauges." 'Transactions,' 1932, pp. 86-96.

[4] "The Effect of Treatment on the Composition of Grass. Results from the Craibstone Drain Gauges." 'Transactions,' 1934, pp. 202-223.

They form small experimental plots so arranged that practically everything going into the soil and all that is removed from it, whether in crops or in drainage, can be measured and analysed. Drain gauge No. I. has been continuously unmanured since before 1914, when the drain gauges were constructed. The soil in it, therefore, is known to have been continuously unmanured for at least twenty-five years. Nos. II. and III. are manured from year to year, and both receive exactly the same manuring. The drain gauges are cropped with a rotation of crops, and in each rotation dung is given with the turnip crop, while other manures are applied with the different crops of the rotation. The only difference between the treatment of Nos. II. and III. is that No. III. receives a dressing of lime each rotation, while No. II. is continuously unlimed. The rainfall is measured by a standard Snowdon Rain Gauge which stands beside the drain gauges. We are thus able to compare a continuously unmanured plot with one which is manured with both dung and artificials, and both of these with a plot which is limed as well as manured with dung and artificials. The rainfall at Craibstone is about 35 inches on the average of the years since the drain gauges started to work. This is shown in Table I., in which the rainfall for each year from 1927 to 1936 is given as well as the average for that period and for the period 1919 to 1936. Table I. also gives the drainage from each lysimeter for the same ten years and the average drainage for the same two periods.

It will be seen that the amount of drainage is on the average a little more than half the rainfall and differs slightly for the different drain gauges. On the whole, most drainage is received from No. I., a little less from No. II., and distinctly less from No. III. This is to be expected, for, as is shown later, larger crops are on the whole obtained from No. III. than from either of the other drain gauges, while No. II. gives larger crops than No. I. It is to be expected that the bigger the crop the greater the amount of water it will use, and the less there will be left to come through as drainage. The difference between I. and II. is, in fact, less than might be expected.

The proportion of the rainfall obtained as drainage from the different lysimeters varies from year to year. For instance, Table I. shows that in each of the years 1927 and 1928 No. I. gave considerably more than No. III. On the other hand, in each of the years 1933 and 1934 No. I. gave least drainage of the three. These variations are due, in part at least, to local circumstances. Thus it is found that when snow falls it is generally unevenly distributed, and in some cases, owing to swirls and eddies of the wind, one drain gauge may be covered with snow to a considerable depth while another may be almost bare. No doubt the rain is also subject to similar uneven distribution. It is also found that the flow of the different lysimeters is uneven. After a fall of rain excess water drains away at somewhat different rates in the different cases. This is no doubt due to local differences in soil, and when the plots are covered with crops, to differences in cover.

TABLE I.—Rainfall and Drainage, in Inches.

Year.	Crop.	Rainfall.	Drainage.		
			Lysimeter I.	Lysimeter II.	Lysimeter III.
1927 . . .	Swedes .	39·08	21·57	19·73	16·64
1928 . . .	Barley .	33·75	17·54	15·78	13·75
1929 . . .	Hay . .	36·71	18·22	18·77	16·60
1930 . . .	Pasture .	38·52	22·72	22·15	22·71
1931 . . .	Pasture .	31·09	16·04	16·34	16·40
1932 . . .	Pasture .	34·76	20·41	20·70	20·19
1933 . . .	Potatoes .	30·85	15·64	15·78	16·14
1934 . . .	Oats .	39·66	17·97	19·60	18·94
1935 . . .	Turnips .	41·07	19·51	20·55	18·50
1936 . . .	Barley .	28·11	12·20	11·15	9·35
Average .	1927-1936	35·36	18·18	18·05	16·92
Average .	1919-1936	34·74	18·69	18·57	17·84
Average Annual Evaporation, 1927-1936			17·18	17·31	18·44
Average Annual Evaporation, 1919-1936			16·05	16·17	16·90

The difference between the rainfall and the drainage gives what we have called the evaporation. The average annual evaporation for each lysimeter is shown in the table. It is obtained by subtracting the drainage from the rainfall.

It consists of moisture which has been evaporated from the surface of the soil or which has been taken up by the crop and transpired from its surface. When the soil is covered by a growing crop no doubt a large part of the water evaporated is not given off directly by the soil, but is transpired by plants. Very little water is evaporated during the winter months while the air is cold and moist and the soil is bare of crop, or if a crop is present it is almost inactive. The amount of drainage, therefore, almost equals the rainfall. On the other hand, as spring advances the air becomes warmer and, on the average, drier also; evaporation, therefore, increases, as does also transpiration through the crop which has now begun active growth. The amount of the drainage, therefore, gradually diminishes, as compared with the rainfall, as spring advances, till in summer and early autumn, when evaporation is at a maximum, it falls to a minimum.

This is illustrated in Table II., which gives the average drainage for each month for the early period 1919-1926, for the later period 1927-36, and for the whole eighteen years 1919-1936. Average figures are also given for the seasons, the winter being taken as the three months December to February inclusive, the spring March to May, the summer June to August, and the autumn the three months September to November inclusive. It will be seen from the table that during the summer the drainage for the whole three months is only a fraction of an inch, though the rainfall for the same three months is 7 to 8 inches, which is not much less than that for the winter three months. During individual months the average drainage falls to nothing at all, or to a very low figure. Thus, during the period 1919-26 the average drainage for June was less than one-tenth of an inch, and during the period 1927-36 the average drainage for July was less than one-twentieth of an inch, though the average rainfall was 2·96 inches.

On the average for the whole period, 1919-36, the drainage is over 88 per cent of the rainfall during the winter months, over 55 per cent during the spring, only about 10 per cent during the summer, and 51 per cent during the autumn months. If it were taken month by month the contrast would be still more decided. It will be seen that the rainfall is, on the average of these eighteen years, lowest during the spring three months, and only slightly higher during the summer three months. Actually, the month with the lowest average is June, a summer month, and the low average of June does much to bring down the summer average, for July is on the average a wet month. The autumn and winter averages are decidedly higher than those for the spring and summer, and during these eighteen years October was the wettest month, November and December following not far behind.

TABLE II.—AVERAGE RAINFALL AND DRAINAGE FOR EACH MONTH AND SEASON, IN INCHES.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Dec. Feb.	Mar. May	June Aug.	Sept. Nov.
	1919-1926.												1919-1926.			
Rainfall . . .	2·98	3·50	1·83	2·54	2·91	1·61	3·27	2·26	3·20	3·40	3·25	3·19	9·86	7·28	7·14	9·85
Drainage Lysimeter I.	3·14	3·26	1·48	1·34	1·37	·11	·59	·09	·47	2·04	2·42	2·99	9·45	4·19	0·79	4·93
,, II.	3·11	3·12	1·63	1·41	1·33	·10	·51	·08	·47	2·00	2·36	3·04	9·36	4·37	0·69	4·83
,, III.	3·21	3·25	1·78	1·40	1·32	·05	·45	·10	·44	1·56	2·40	3·00	9·56	4·50	0·60	4·40
	1927-1936.												1927-1936.			
Rainfall . . .	2·76	1·87	2·24	3·09	2·35	2·34	2·96	3·20	3·22	3·88	3·69	3·75	8·31	7·68	8·50	10·78
Drainage Lysimeter I.	2·41	1·62	1·64	1·71	·69	·55	·05	·36	1·06	1·97	2·99	3·13	6·91	4·04	0·96	6·02
,, II.	2·45	1·59	1·65	1·73	·69	·52	·03	·41	·96	1·97	2·97	3·07	6·86	4·07	0·96	5·90
,, III.	2·29	1·51	1·58	1·67	·63	·47	·01	·36	·89	1·78	2·83	2·91	6·45	3·88	0·83	5·50
	919-1936.												1919-1936.			
Rainfall . . .	2·86	2·59	2·06	2·85	2·60	2·02	3·09	2·78	3·21	3·66	3·49	3·50	8·99	7·51	7·89	10·36
Drainage Lysimeter I.	2·73	2·35	1·57	1·54	·99	·35	·29	·24	·80	2·00	2·73	3·07	8·04	4·10	0·88	5·53
,, II.	2·74	2·27	1·64	1·58	·97	·33	·24	·26	·74	1·98	2·70	3·06	7·97	4·19	0·83	5·42
,, III.	2·70	2·28	1·67	1·55	·94	·29	·20	·24	·69	1·68	2·64	2·95	7·83	4·16	0·73	5·01

One of the main objects in view when these experiments were started was to discover how far manurial constitutents were washed from the soil under ordinary conditions of cropping. The drainage water from the three lysimeters is, therefore, measured and analysed each month. A summary of the results for all the principal substances found in the drainage is given in Table III.

The figures for nitrogen, potash, and lime will be discussed later. As has been shown in earlier papers, only traces of phosphoric acid are lost in the drainage. No matter how heavily we manure with superphosphate, or any other soluble phosphatic manure, no significant quantity of phosphoric acid is found in the drainage. The phosphoric acid is completely fixed and retained by the soil.

TABLE III.—PRINCIPAL SUBSTANCES WASHED THROUGH IN THE DRAINAGE. TOTAL FOR PERIOD IN POUNDS PER ACRE.

	Nitrogen.	Phosphoric Acid.	Sulphuric Acid.	Chlorine.	Potash.	Soda.	Lime	Magnesia	Silica
1919-1926									
I.	99·0	traces	537·0	476·1	102·7	533·6	608·4	245·7	854·6
II.	97·5	traces	791·4	527·6	98·7	562·5	664·3	255·4	825·2
III.	113·1	traces	905·0	529·6	92·0	563·7	892·3	282·6	752·1
1927-1936									
I.	43·3	traces	386·4	531·1	61·3	505·4	627·4	240·7	413·3
II.	48·0	traces	1440·8	1009·6	77·4	826·3	1247·2	387·6	482·7
III.	45·8	traces	1496·0	946·5	67·2	702·0	1488·1	379·6	441·4
1919-1936									
I.	142·3	traces	923·4	1007·2	164·0	1039·0	1235·8	486·4	1267·9
II.	145·5	traces	2232·2	1537·2	176·1	1388·8	1911·5	643·0	1307·9
III.	158·9	traces	2401·0	1476·1	159·2	1265·7	2380·4	662·2	1193·5

It is quite otherwise with sulphuric and hydrochloric acids. These are not fixed by the soil, but are washed through in the drainage. They are not washed through as acids, but as salts of lime, magnesia, &c. Similarly, the potash, soda, lime, and magnesia shown in the table are not washed through in the free state, but combined with the acids as salts. When manures like sulphate of ammonia and superphosphate, which contain sulphates, are applied as manures to Nos. II. and III. greatly increased amounts of sulphuric acid are found in the drainage of these lysimeters. Similarly, when potash manure salt or any other manure containing chlorides is used, the chloride after a time appears in the drainage;

hence the drainage of Nos. II. and III. contains much more chlorine than that from No. I. As these increased amounts of acids are washed out as salts of soda, lime, and magnesia, the amounts of these bases are also increased in the drainage from the manured lysimeters. As No. III. is limed as well as manured more lime, but less soda, is found in the drainage of this lysimeter as compared with No. II.

TABLE IV.—MANURES ADDED TO LYSIMETERS II. AND III.
RATE PER ACRE.

Year.	Crop.	Manures.		Time of application.
1927	Swedes	Farmyard Manure,	12 tons	May
		Sulphate of Ammonia,	1 cwt.	„
		Superphosphate,	4 „	„
		Steamed Bone Flour,	1 „	„
		Muriate of Potash,	1 „	„
1928	Barley	Sulphate of Ammonia,	1½ „	April
1929	Hay	„ „	1 „	May
		Superphosphate,	2 „	„
		Potash Manure Salt,	2 „	„
1930	Pasture	Ground Mineral Phosphate,	4 „	November
		Kainit,	4 „	„
1931	Pasture	Sulphate of Ammonia,	1½ „	March
		„ „	1½ „	May
		„ „	1 „	September
1932	Pasture	„ „	1½ „	March
		„ „	1½ „	June
		„ „	1 „	August
1933	Potatoes	„ „	1½ „	May
1934	Oats	„ „	1 „	March
		Superphosphate,	2 „	„
		Potash Manure Salt,	2 „	„
1935	Turnips	Farmyard Manure,	12 tons	May
		Sulphate of Ammonia,	1 cwt.	„
		Superphosphate,	4 „	„
		Steamed Bone Flour,	1 „	„
		Muriate of Potash,	1 „	„
1936	Barley	Sulphate of Ammonia,	1 „	April
		Superphosphate,	2 „	„
		Potash Manure Salt,	2 „	„

In addition, lysimeter III. received ground lime at the rate of 2770 lbs. per acre, equal to 2 tons of carbonate of lime per acre in October 1934.

A considerable amount of silica, present as soluble silicates, is found in the drainage of all three lysimeters, but carbonic acid, which is commonly found in drainage water under different conditions of soil, is rarely or never found in the drainage from these lysimeters.

During the period 1927 to 1936 the manuring given to Nos. II. and III. was much heavier than during the first rotation 1921 to 1926. Not only was intensive nitrogenous manuring given to the grass during two seasons, but heavier manuring than in the first rotation was given to hay, grain, and turnip crops. In the first rotation it was found that the nitrogen and the potash added as manures were only a small fraction of what was removed in crops alone, without taking into account what was lost in the drainage, so it was decided to increase the dressings during this period and study the effects.

Table IV. gives the manures applied to each crop on lysimeters II. and III.

It will be seen that manures were applied every year during the period 1927 to 1936. The manures applied in 1930, however, were not meant for the crop of that season, but were given in November in preparation for the intensive nitrogenous manuring given to the grass during 1931 and 1932. The crop of 1929 is called hay because it was allowed to grow tall and form flowering heads on the grass and clover and cut at the stage at which the crop is usually cut for hay. Aftermath was cut in the autumn. During the succeeding three years the crop is called 'pasture.' It was not possible of course to pasture animals on these small plots, but the crop was cut at frequent intervals, as a rule once a month, so as to keep it short and prevent stemmy material growing and to imitate as nearly as possible the conditions of land which is pastured. Both farmyard manure and artificials were given to the turnip crops in 1927 and 1935. Lysimeter III. received, in addition to the manures given to No. II., a dressing of ground lime in the autumn of 1934.

Table V. gives the amounts of nitrogen, phosphoric acid, potash, and lime supplied by these manures. The lime applied to both II. and III. was given in compounds of lime, such as phosphates of lime, contained in such manures as superphosphate, steamed bone flour, and ground mineral phosphate. Only lysimeter III. received a dressing of lime as such, and that only once in the course of the ten years.

The next table, VI., shows the amount of nitrogen washed from each lysimeter in each year. The results are even more striking than those obtained in the first rotation. Then it was found that very little more nitrogen was washed from the manured drain gauges II. and III. than from the unmanured No. I., and that the total amount of nitrogen washed from any of them was very small, especially when the soil was under grass, which continuously covers the ground both in summer and winter.

The results for 1927 to 1936 show even smaller losses of nitrogen than in the preceding period, although the nitro-

TABLE V.—MANURIAL CONSTITUENTS APPLIED TO LYSIMETERS II. AND III. POUNDS PER ACRE.

	1927.	1928	1929	1930	1931	1932	1933	1934.	1935	1936	1927-36
Nitrogen—											
Organic . .	102·2	..	..	..	..	..	..	..	182·9	..	285·1
Ammoniacal . .	25·9	35·2	23·5	..	93·8	92·0	35·1	23·5	61·2	23·5	413·7
Total . .	128·1	35·2	23·5	..	93·8	92·0	35·1	23·5	244·1	23·5	698·8
Phosphoric Acid (P_2O_5)	203·5	..	44·9	118·7	..	..	..	39·4	343·2	48·8	798·4
Potash (K_2O) . .	136·0	..	71·5	73·4	..	..	..	70·8	146·3	70·6	568·6
Lime (CaO) . .	292·2	..	70·7	229·8	..	..	..	61·3	291·1	73·4	1018·5

Lysimeter III. received in addition a dressing of ground lime in October 1934 which supplied lime (CaO) at the rate of 2496 3 lb per acre, equal to approximately 2 tons of carbonate of lime (CaCO) per acre.

genous manuring was much heavier. Further, there is no great difference in most years between the amount of nitrogen washed from the manured plots as compared with the unmanured one. The figures for the four years when the plots were under grass are especially notable. Though a dressing of sulphate of ammonia at the rate of 4 cwt. per acre, equal to over 90 lb. of nitrogen, was given in 1931 and again in 1932, a negligible amount of nitrogen, under one pound per acre per annum, was washed away from each of the drain gauges, and what was washed away from Nos. II. and III. was quite similar in amount to what was washed out of No. I. which received no manure. Neither of these years was one of drought, and in both there was a large amount of drainage. The conclusion to be drawn is that in a climate with a rainfall of 30 to 40 inches there is no danger of any loss of nitrogen, even from land which is heavily manured, so long as the soil is under grass. Even when other crops are grown, such as grain crops, turnips, and potatoes, which cover the soil for a portion of the year only, the amount of loss is so small as to be scarcely worth consideration. The nitrogen found in the drainage water is practically all in the form of nitrate, only traces of ammonia are found. The ammonia and organic nitrogen applied to the soil are turned by the action of soil bacteria into nitrates. These are not held by the soil, but are so rapidly taken up by crops that practically nothing is washed out by the drainage. On the average of the whole ten years less than 5 lb. per acre per

TABLE VI.—NITROGEN IN THE DRAINAGE WATERS.
POUNDS PER ACRE.

	I	II.	III.
1927. Swedes . .	12·8	10·8	8·1
1928. Barley . .	12·2	12·8	11·9
1929. Hay . .	5·7	8·9	9·9
1930. Pasture .	5·4	5·2	5·6
1931. Pasture .	·6	·6	·6
1932. Pasture .	·9	·9	·9
1933. Potatoes .	·6	·8	·9
1934. Oats . .	1·8	2·6	2·7
1935. Turnips .	2·1	3·5	3·5
1936. Barley . .	1·1	1·8	1·7
Average: 1927-1936	4·3	4·8	4·6
Average: 1919-1936	7·9	8·1	8·8

annum was washed from each plot. This small amount was washed away chiefly at the time of year when no crop was covering the ground. In any case, almost as much, on the average, was washed from the unmanured as from the manured plots.

Table VII. shows the amounts of potash and lime washed by the drainage from each lysimeter in each year and the average amounts washed away during the whole period.

Potash, like ammonia, is fixed and retained by the soil, and a process of base exchange takes place by which lime, and if they are present in sufficient amount, soda and magnesia, are washed away in its place. Craibstone soil is well supplied naturally with potash, and from the unmanured soil on the average a little over 6 lb. of potash per acre per annum was washed away in the drainage. Very little more is washed from Nos. II. and III., which received considerable dressings of soluble potash manures. It is noteworthy that rather less is lost from No. III. than from No. II. This is no doubt due to the lime received by No. III., which would in consequence have a better supply of available lime to take the place of potash by base exchange.

TABLE VII.—Potash and Lime removed in the Drainage. Pounds per Acre.

	Potash			Lime		
	I	II	III	I	II	III
1927 . . .	9·8	9·4	8·7	80·8	113·0	118·9
1928 . . .	8·0	9·0	6·9	77·8	115·3	132·9
1929 . . .	6·5	8·9	6·8	50·1	119·4	147·3
1930 . . .	4·6	6·8	7·3	56·4	144·4	165·3
1931 . . .	4·4	5·4	4·2	38·3	97·9	113·6
1932 . . .	7·8	10·5	8·2	40·8	123·1	139·8
1933 . . .	5·4	5·7	5·4	66·3	104·1	151·2
1934 . . .	5·1	6·9	6·1	102·8	220·4	263·8
1935 . . .	6·0	9·2	8·2	75·5	132·0	167·8
1936 . . .	3·6	5·8	5·2	38·6	77·6	87·3
Average: 1927-36	6·1	7·8	6·7	62·7	124·7	148·8
Average: 1919-36	9·1	9·8	8·8	68·7	106·2	132·3

In the case of lime, as might be expected, much more is washed away from Nos. II. and III. than from No. I. The manures applied to Nos. II. and III., especially the sulphate of ammonia and the potash salts, supply acids which are washed away in the drainage combined with lime and other bases. Therefore the use of these manures leads to increased loss of bases, especially lime, in the drainage. No. II. loses on the average twice as much lime in the drainage as No. I. This illustrates the fact that a soil which is well manured, especially with such manures as sulphate of ammonia and soluble potash manures, has its supply of lime exhausted more quickly than an unmanured soil and therefore requires liming more frequently. No. III., which has been limed, loses rather more lime than No. II., but as was shown in Table III. this is because it loses less of its natural supplies of soda and magnesia. The total loss of bases from No. II. is as great as that from No. III.

TABLE VIII.—WEIGHTS OF CROPS GROWN ON THE LYSIMETERS. PER ACRE.

Lysimeter.	As Cut.						Dry Matter.					
	I.		II.		III.		I.		II.		III.	
	cwt.	lbs	cwt.	lbs.	cwt.	lbs.	cwt.	lbs.	cwt.	lbs.	cwt.	lbs.
1927. Swedes: bulbs .	221	0	289	0	394	0	29	26	41	40	56	97
1928. Barley grain .	25	27	36	34	40	41	22	0	33	20	37	56
1928. Barley straw .	29	30	44	53	69	82	23	30	35	103	61	55
1929. Hay 1st cut .	148	50	111	26	121	9	39	38	34	55	36	36
1929. Hay 2nd cut .	88	65	58	74	50	66	21	95	14	107	13	0
1930. Pasture .	81	27	87	82	96	62	19	17	20	19	22	27
1931. Pasture	110	100	143	6	177	5	22	60	28	58	33	109
1932. Pasture . .	109	33	150	50	177	67	23	7	30	71	35	54
1933. Potatoes . .	160	48	189	74	139	106	39	23	46	48	34	4
1934. Oats grain .	not taken						8	6	12	21	20	0
1934. Oats straw .							11	18	15	59	20	70
1935. Turnips: bulbs .	227	76	352	76	330	40	22	4	32	89	31	2
1936. Barley grain .	22	27	26	31	29	44	18	91	23	79	26	74
1936. Barley straw .	20	26	31	5	37	34	18	32	27	60	33	109

We next turn to the crops grown on the drain gauges. Table VIII. gives the weight of the crop obtained from each gauge in each year calculated per acre. The weight is given of each crop in the moist state as it was cut, and also the weight of dry matter contained in it.

The unmanured drain gauge No. I. has received no manure since before 1914, when the construction of the drain gauges began. It has been continuously cropped since 1919, and all the crops have been removed from it and nothing has been returned. In ordinary farm practice a considerable part of the manurial value of the turnips and straw, and also of the portion of the grain which is fed to stock, is returned to the soil in the farmyard manure. Also when the land is grazed a large part of the manurial value of the grass consumed is returned to the soil in the droppings of the grazing animals.

In this case no farmyard manure is applied, and as no animals are actually grazed on this small area, no droppings are returned; but the whole of the grass cut from month to month to represent grazing, is removed, and no part of its manurial value restored to the soil. Keeping this in mind it is remarkable that such large crops continue to be grown on this plot after it has received no manure of any kind for so long a period. The crop of swedes in 1927 was not very large, but was quite a fair crop for unmanured land, while the crop of barley in 1928, over 25 cwt. of grain and over 29 cwt. of straw, was so heavy that it injured the succeeding grass crop by partially smothering it. Nevertheless, the hay crop in 1929 was heavy. The first cut of hay yielded nearly 2 tons of dry matter per acre, which is equal to about 46 cwt. of hay per acre. The first and second cuts taken together yielded over 3 tons of dry matter, equal to 3 tons 10 cwt. of hay of ordinary dryness. The crop of potatoes in 1933 was quite a good one, over 8 tons per acre, and a heavy crop of barley was again obtained in 1936. The turnip crop in 1935 was similar to the swede crop in 1927. The only crop in the ten years which was really light was the oat crop in 1934 which followed potatoes, and yielded only 8 cwt. of dry matter per acre in grain and 11 cwt. in straw.

As in the case of the first rotation, it was found that the hay crop yielded a far greater weight of dry matter per acre than the succeeding 'pasture' crops, which were never allowed to grow up, but were cut at about monthly intervals, so that the grass was never allowed to grow more than a few inches high. The dry matter obtained in the hay year, 1925, was nearly equal to total amount obtained in the three pasture years. It was not, however, of such good quality.

While the crop of barley grown on the unmanured No. I. in 1928 was heavy enough to injure the following grass crops to a certain extent, the much heavier crops obtained from the manured plots II. and III. nearly smothered the clover and seriously injured the grass. The barley crop obtained from No. III. was enormous, over 2 tons of grain and nearly 3½ tons of straw, consequently there was practically no clover on III., and the grass was very thin. The condition of No. II. was nearly as bad. All the plots, therefore, were raked over in the spring of 1929, and grass and clover seeds resown on them. Though Nos. II. and III. were manured for hay, as shown in Table IV., No. I., though unmanured, gave a heavier crop than either II. or III. This was especially the case in the aftermath which, in the case of No. I., was largely composed of clover. Nos. II. and III., though resown in the spring, contained comparatively little clover and gave light crops of aftermath.

In 1930 the manured plots caught up on No. I. and surpassed it to a small extent. Even in the following years when these plots were intensively manured they did not yield the crops which we expected to obtain from such treatment. They certainly yielded, especially in 1932, considerably greater crops than No. I., but the increase was not a great return for the heavy manuring employed. These results illustrate the very injurious effect which a heavy grain crop may have on the succeeding hay and pasture crops, and especially on the amount of clover in them. No subsequent manuring seems to be able to make up completely for the injury done by the smothering of the clover by a heavy grain crop.

The next table, Table IX., gives the quantities of nitrogen, phosphoric acid, potash, and lime removed from each lysimeter by the crops grown upon it. All the crops are weighed and analysed, and these figures are based on the results of the analyses.

If these figures are compared with those in Tables VI. and VII. it will be seen that, except in the case of lime, far more is removed from the soil in crops than in drainage. Table VI. shows that, during the ten years we are dealing with, less than 50 lb. of nitrogen per acre was removed in the drainage from any one of the three lysimeters. The amount of nitrogen removed in crops from the unmanured lysimeter amounts on the average to about 64 lb. per acre per annum, and in the case of those manured is considerably larger. In fact, more nitrogen is removed in an average crop in one year than in the drainage of ten years.

In the case of phosphoric acid none is removed in solution in the drainage water, while the crop removes a considerable quantity, which, in the case of No. I., averages nearly 25 lb. per acre per annum. The case of potash is somewhat similar to that of nitrogen. Far larger quantities are removed in the crops than in the drainage. If we take again the case of No. I., about 61 lb. per acre was washed out in drainage in the ten years, while, in the same period, over nine times as much, about 559 lb., was removed in the crops.

It is quite otherwise with lime, the main loss of which from the soil is in the drainage. Comparison of the tables shows that less than half as much lime was removed from No. I. in the crops as was removed in drainage. Nor is this all. Table IX. shows that the total amount of lime removed from II. and III. in the crops during the ten years is distinctly less than that removed from No. I., but Table VII. showed that the lime removed in the drainage from II. and III. was far greater than that removed from No. I. In both Nos. II. and III. the amount removed in the drainage is about five times as great as that removed by crops.

Clover contains a far greater proportion of lime than grass. More than half the lime removed in crops from No. I. was

TABLE IX.—CONSTITUENTS REMOVED BY THE CROPS FROM THE LYSIMETERS. POUNDS PER ACRE.

Lysimeter.	Nitrogen.			Phosphoric Acid.			Potash.			Lime.		
	I.	II.	III.	I	II.	III	I	II	III.	I.	II.	III
1927. Swedes .	41·9	54·6	85·7	28·8	40·3	51·9	55·0	76·0	105·7	20·9	27·8	38·2
1928. Barley .	48·5	79·2	131·3	21·4	41·9	52·1	37·8	77·2	105·7	7·1	11·8	21·2
1929. Hay .	143·7	87·6	83·3	42·9	32·6	34·9	104·5	109·6	82·7	163·7	78·0	70·9
1930. Pasture .	66·7	79·2	82·8	16·8	18·6	21·1	48·9	53·9	57·0	19·5	24·6	26·1
1931. Pasture .	85·1	99·6	124·8	25·4	33·0	36·2	53·8	107·3	110·6	26·9	24·1	31·9
1932. Pasture .	87·4	107·9	128·8	23·8	29·1	35·9	61·7	99·0	103·6	28·7	29·2	39·8
1933. Potatoes .	67·2	82·1	61·4	28·1	31·2	26·7	77·7	97·2	69·4	1·4	1·9	1·9
1934. Oats .	19·8	30·6	46·1	16·5	23·6	34·0	19·8	29·3	41·9	7·3	10·3	14·7
1935. Turnips .	28·6	45·5	41·9	26·2	41·5	39·9	65·2	99·2	96·6	20·5	26·4	32·6
1936. Barley .	40·1	57·8	74·5	19·0	30·7	36·5	34·3	54·8	66·3	6·4	9·5	9·9
Total .	639·0	724·1	860·6	248·9	322·5	369·2	558·7	803·5	839·5	302·4	243·6	287·2

removed in the hay crop of 1929, which was comparatively rich in clover. The hay crops of II. and III. were not only smaller than that obtained from I., but were much poorer in clover, consequently they do not remove half as much lime as the crop of No. I. In all the other years, as might be expected, the crops from II. and III. remove more lime than those obtained from No. I.

If we compare Table IX. with Table V. it will be seen that more nitrogen and potash was removed by crops in the case of lysimeters II. and III. than was applied as manures. The crops obtained from these lysimeters removed nearly half as much phosphoric acid as was applied in manures. As we have seen, the main removal of lime was in the drainage and not in the crops.

A kind of balance-sheet is supplied by Table X., in which the amounts of nitrogen, phosphoric acid, potash, and lime added in manures, together with the small amount of nitrogen brought down by the rain, are compared with the amounts of the same constituents removed from the soil by the crops and by the drainage.

Nitrogen.—Rain-water is collected alongside the drain gauges, and the amount of combined nitrogen contained in it is determined every month. This amounts on the average to a little over 3 lb. per acre per annum, and is chiefly in the form of ammonia. The nitrogen brought down by the rain is added, in Table X., to that supplied by manures. In the case of No. I. it is the only extraneous nitrogen added.

The total nitrogen removed from No. I. in crops and drainage during the ten years is over 6 cwt. per acre, or nearly 70 lb. per acre per annum. But, as Table VIII. shows, it continues to grow good crops though continuously unmanured. We know that this soil contained a good supply of nitrogen in the surface 9 inches when the experiments started, but a very great deal has been removed in the crops and drainage in the twenty-five years during which it has received no manure. This would undoubtedly reduce its fertility were it not obtaining a good supply of nitrogen from the free nitrogen of the air through bacterial action. We have no means of making any exact measure of this. We know, however, that both in the first rotation and in the period 1929-1932, when the crop was again grass, there was far more clover on No. I. than on either No. II. or III. This clover no doubt enriched the soil with a large, but unknown, amount of nitrogen and helped No. I. in this respect more than II. and III., and thus helped to neutralise the handicap under which it suffered from receiving no nitrogenous manure. The natural fixation of nitrogen through the clover, and by the action of *Azotobacter* and other nitrogen-fixing organisms

TABLE X.—Constituents added to and removed from the Soil, 1927-1936. Pounds per Acre.

Lysimeter.	Nitrogen.			Phosphoric Acid			Potash.			Lime.		
	I.	II.	III	I	II.	III	I	II	III	I.	II.	III.
Added in Manures .	..	703·7	703·7	..	798·4	834 4	..	568·6	568·6	..	1018·4	3495·1
Brought down by Rain	34·4	34·4	34·4	..	..	..	.	.	..	..	..	..
Total . .	34·4	738·1	738·1	..	798·4	834·4	..	568·6	568·6	..	1018·4	3495·1
Removed by Crops .	639·0	724·2	860·7	248·9	322·6	369·2	558·8	803·5	839·5	302·5	243·6	287·2
Removed by Drainage	43·3	48·0	45·8	..	..	..	61·3	77·4	67·2	627·4	1247·1	1488·1
Total . .	682·3	772·2	906·5	248·9	322·6	369·2	620·1	880·9	906·7	929·9	1490 7	1775 3

in the soil, is evidently able to maintain the nitrogen fertility of this soil for a long period.

Lysimeters II. and III., on the other hand, are probably increasing in nitrogen fertility. The amount of nitrogen removed in crops and drainage is, in the case of No. II., a little greater than that supplied in manures and rain, but there will also be fixation of nitrogen through clover and by free living organisms in the soil, and, though this is no doubt less than is gained by No. I. from the same sources, it is in all probability greater than the small difference between the nitrogen added to the soil by manures and rain and that removed in crops and drainage. Somewhat similar considerations apply to No. III., though more nitrogen is removed by crops in this case and probably less is fixed through the growth of clover.

Phosphoric Acid.—The soil of Nos. II. and III. is being gradually enriched in phosphoric acid. Practically nothing is being removed in drainage, and the amount removed by crops is much less than that added in manures.

The case of No. I. is interesting. It has been losing phosphoric acid during the ten years at an average rate of about 25 lb. per acre per annum, but the continued growth of turnip crops shows that it still has a fair supply of available phosphoric acid. An excellent test of the capacity of a soil to supply phosphoric acids for crops is its power of growing a turnip crop without the addition of any phosphatic manure. Measured by this test, this soil is not falling off to any appreciable extent in its phosphate fertility. The analyses of the soil made when the drain gauges were constructed showed that this soil contains a good supply of phosphate. This has apparently been sufficient to maintain crops at a fair level for the long period during which this soil has been cropped without manures.

Potash.—It has been shown in previous papers that this granitic soil contains great natural reserves of potash, and also of the bases soda, lime, and magnesia in the unweathered, or only partially weathered, minerals such as feldspars, which it contains in large quantities. There is little indication of any deficiency of potash even on the unmanured lysimeter, which was able to grow a good crop of potatoes without any potash manure, and which grew better crops of clover than the manured plots. No. I. lost potash on the average at the rate of 62 lb. per acre per annum in the crops and drainage. The manured lysimeters II. and III. lost potash at a greater rate both in the crops and drainage, but this increased rate of loss was more than compensated by the manures added. No doubt this soil could continue to grow good crops for a very long period without any addition of potash manures.

Lime.—Large quantities of lime were removed from all the lysimeters, especially in the drainage. There is little doubt that this soil could supply from its reserves in unweathered or partially weathered silicates all the lime and other bases required, by an unmanured soil at any rate, for a long period. As has been shown above, the addition of the manures, and especially of such manures as sulphate of ammonia and soluble potash salts, greatly increases the loss of lime and other bases in the drainage. To meet this greatly increased loss it is probably advisable to lime the soil, as has been done in the case of lysimeter III., from time to time. Such a dressing of lime as has been given to No. III., once in each rotation before the turnip crop, is more than sufficient to meet all the losses of lime in crops and drainage, even when the soil is well manured with substances which lead to a heavy drain on the lime of the soil through the drainage.

AGRICULTURAL RESEARCH IN SCOTLAND IN 1937.

BEING A BRIEF SUMMARY OF WORK AT THE SCOTTISH AGRICULTURAL RESEARCH STATIONS DURING THE YEAR.

Readers desiring fuller information on any of the subjects mentioned should write to the Director of the Station at which the investigation is being carried out.

INSTITUTE OF ANIMAL GENETICS.

University of Edinburgh, West Mains Road.

Cattle.—A study is being made (with the assistance of Dr Smith of the East of Scotland College of Agriculture) of the protein and casein content of milk. The content of milk in these substances is high at the start of the lactation, drops sharply at about the sixth week, and shows a gradual increase thereafter, which becomes more marked towards the end of the lactation. There is a high positive correlation between total yield of milk and total yield of protein and casein. There are certain causes which affect the yield of milk without affecting the yield of protein. It has been possible to determine that fortnightly samples are reasonably accurate, and that after the sixth week of lactation three-weekly samples should suffice. The genetic aspect of the protein and casein content is being investigated.

Two papers have been published on the inheritance of milk yield in Dairy Shorthorn cattle. The performance of bulls has been examined, based on the recorded yields of their daughters, comparing only yields made by daughters within one herd. It has been shown that certain bulls leave daughters showing considerable variation in their average yields, while the yields of daughters of other bulls do not vary greatly from the average of all the daughters of the bull examined.

This is of considerable importance in the improvement of a dairy breed by means of the Progeny Test, and must be considered in any attempt to fix productivity at the level most desired. The other paper deals with the possibility that the inheritance of milk yield is partly governed by sex-linked factors.

Pigs.—The work noted in the previous report is being continued. As this work had thrown light on the importance of the pre-weaning life of the young pig, certain experiments were designed to secure information on this aspect of pig production about which very little scientific knowledge is available.

By weighing pigs immediately before and after suckling, it has been found possible to measure the amount of milk produced by sows. A big difference was found in the quantity of milk from different sows. The amount of milk a sow gives is partly conditioned by the size of the litter, and, to a lesser extent, by nutrition. The most important factor is probably the hereditary one. In general, the largest pigs in a litter obtain the most milk, but they do not make the most economic use of that milk. Apparently, once a young pig receives sufficient milk for its maintenance requirements, it does not convert the surplus into live weight economically. The forward nipples of the sow's udder tend to be more productive than those at the rear.

An examination has been made of the process of suckling. First, there is a preliminary period during which the litter sorts itself out and stimulates the flow of milk by massaging the udder. The second stage begins suddenly, during which the pigs suckle rapidly. The third stage follows shortly, and consists of an extended repetition of the first, including rather more suckling: little or no milk is obtained at this stage.

Strong preferences have been found to exist amongst members of a litter for particular nipples. It appears that within a few days after farrowing, the young pigs become capable of recognising their positions in relation to the formation of the sow as a whole, and later become accustomed to suckling the proper nipple in the upper or lower row as the sow changes from side to side.

Poultry.—Data is still being accumulated on the inheritance of productivity in the fowl. It has been found that the date at which a pullet produces her last egg at the end of the first laying year is the expression of an inherited tendency which may or may not be affected by environmental agencies. On the average, the date of onset of moult in the second year was five days earlier. From an analysis of the hatching weight of chickens, it was found that spring eggs produced the maximum size of chick in relation to the size of the egg. Experiments leading to the induction of sex reversal through injection of substances into the incubating egg are yielding interesting results.

Rabbits.—The new waved type of coat associated with some strains of the Rex variety, and somewhat similar to Astrakhan, has been shown to be a simple recessive to normal Rex, and can be produced in any colour known in rabbits.

Experimentation to control the extent of saddle or shading in Sable variety has been undertaken, and preliminary data suggest that this may come to a satisfactory conclusion, which will be of considerable importance to the rabbit pelt industry. Records concerning the duration of pregnancy, fertility, fecundity, and the sex ratio are being collected.

ANIMAL DISEASES RESEARCH ASSOCIATION.

MOREDUN INSTITUTE, GILMERTON, MIDLOTHIAN.

Louping-Ill Vaccine.—Louping-ill vaccine continues to prove a highly effective method of preventing the disease. Attempts have been made to produce a hyper-immune louping-ill serum, which can be employed in the case of young lambs. Preliminary experiments have yielded encouraging results, and the product will this year be tested under controlled conditions in the field.

Braxy.—The formalinised whole culture vaccine now issued as a single dose vaccine continues to prove an effective method of prevention, and on many farms the disease has been reduced to an almost negligible incidence.

Grass Sickness in Horses.—During the prolonged investigation to which this problem has been subjected a bacterial toxin was found in a proportion of peracute cases of the disease. With the object of testing the possible significance of this toxin in the causation of grass sickness, an extensive field experiment was organised in 1937, in which 945 horses in the field were vaccinated and so immunised to the toxin, and approximately 2000 horses on the same farms served as controls. It was found that, while vaccination produced a satisfactory degree of immunity to the toxin, it failed to prevent the disease. It would thus appear that the toxin in question is not concerned in the primary causation of grass sickness. The investigation is this year being continued on intensive lines in the field and in the laboratory.

Scrapie.—Evidence has been obtained that scrapie is due to an infective agent which can be transmitted by the inoculation of certain tissues, and there is also evidence which indicates that the disease can be transmitted through the medium of the pasture. It is proposed this year to carry out an extensive study of the disease on an experimental hirsel with the object of determining, if possible, the nature of the infective agent and the means by which it produces its pathological effects.

Contagious Bovine Abortion.—The results of the study of *Brucella abortus* infection in small laboratory animals and of the tests by which the efficiency of various forms of protective vaccine were assessed have been handed over to the Agricultural Research Council, who will continue the investigation in cattle at the Council's Research Station at Compton. A number of immunological studies are being continued at Moredun Institute.

White Scour in Calves.—The investigation carried through in 1936-37, which was designed to determine the preventive value of Vitamin A in white scour, yielded encouraging results, and during the present year the work is being repeated and extended.

Pine.—The possible significance of cobalt deficiency in the causation of certain forms of pine is being investigated, since in similar disease conditions which occur in cattle in Australia and New Zealand it has been found that a cobalt deficiency is the apparent causal factor.

Lactation Tetany.—As a result of a preliminary survey it was found that this disease is of fairly common occurrence throughout Scotland. In collaboration with the Macaulay Institute for Soil Research the soil and pasture of various farms on which lactation tetany is prevalent have been analysed, and experiments are in progress with the object of discovering the nature of the metabolic disturbance which underlies the causation of the disease.

Milk Fever.—In veterinary practice milk fever is now generally treated by the specific chemo-therapeutic method which was evolved by the Institute. The method consists in the subcutaneous or intravenous injection of calcium borogluconate. The chemical nature of this substance has been studied and its precise formula discovered. As a result it is hoped that this specific method of curative treatment can be even further improved.

THE ROWETT RESEARCH INSTITUTE.

BUCKSBURN, ABERDEEN.

Cattle.—The experiment designed to elucidate the factors influencing the value of store cattle from different districts has been concluded. The results showed that, provided the store cattle were of approximately the same breeding and were treated in exactly the same way subsequent to purchase, receiving the same quantity and kind of food, then their place of origin appeared to have no influence on their progress.

Pigs.—The series of experiments on individual *versus* group feeding of fattening pigs have shown that individual feeding is of little or no advantage in securing economy of live-weight increase or improvement in grading.

A comparison of the effect of different husbandry methods on the mortality and growth of young pigs has been commenced. The breeding herd of sows has been divided into three sections. One section will be farrowed at the central piggery; a second section in huts on the tethering system; a third on the old-fashioned and reputedly successful system of one sow and litter to a croft. This experiment is in progress.

Sheep.—An experiment designed to give information on the nutritional conditions predisposing to the development of pregnancy toxæmia in sheep is being concluded. Ninety pregnant ewes were divided into six groups of fifteen, and all sheep were confined indoors in order to secure complete control of food consumption. Biochemical investigation of the blood, with particular reference to ketonæmia, was carried out. The results have not yet been prepared for publication. It would appear, however, from the results already available that ketonæmia is profoundly influenced by nutrition. Certain commonly accepted views regarding pregnancy toxæmia or ketonæmia in sheep, such as the predisposing effect of lack of exercise and excessive fatness, received no confirmation from the experiments conducted. On the contrary, the deductions made from the results of the questionnaire conducted by the North of Scotland College of Agriculture, in collaboration with the Rowett Institute, which suggested underfeeding, and particularly insufficient protein feeding, as predisposing causes of pregnancy toxæmia as it occurs locally, received considerable support from the experiments. Other nutritional factors which appear to have affected the results are under consideration.

An experiment on the effect of nutrition as it affects the resistance of lambs to an artificial worm infestation has been conducted in collaboration with the North of Scotland College of Agriculture. Groups of twenty parasite-free lambs were fed on widely divergent nutritional levels. All lambs received the same number of infective worm larvæ by stomach tube. At the close of the experiment the lambs were slaughtered and the number of stomach worms individually counted. In the well-fed group of lambs the total number of stomach worms recovered from nineteen lambs were: Large Stomach Worm, 33; Small Stomach Worm, 219. In the badly-fed group of lambs the corresponding figures were: Large Stomach Worm, 1533; Small Stomach Worm, 4352. Since all other conditions, except feeding, were constant as between the two groups of lambs, it is clear that nutrition is a factor of first importance in determining the resistance of lambs to worm infestation.

Poultry.—Research on fowl paralysis was continued with the support of the Agricultural Research Council. The experiments, conducted on a large scale, depended for their complete success on maintaining certain groups of birds entirely free from all possible sources of infection, including coccidia. Unfortunately, such complete isolation, a procedure of admitted difficulty, was only successful over a period of four months. Nevertheless, certain tentative conclusions can be drawn from these experiments. For the second successive year Dr Greenwood's fowl paralysis-free chickens from the Institute of Animal Genetics at Edinburgh developed typical fowl paralysis at the Rowett Institute. Moreover, the more complete their isolation from other poultry at the Rowett Institute the fewer cases of fowl paralysis occurred among them. These results are in keeping with the view that an infectious agent is concerned with the ætiology of fowl paralysis. They are very difficult to interpret on the more generally accepted view that fowl paralysis is an expression of the inherited degeneracy of certain strains of fowls.

THE SCOTTISH PLANT BREEDING STATION.

Craigs House, Corstorphine, Edinburgh.

Investigations are being carried out on oats, herbage plants, swedes, and potatoes, but each year only one of these is made the subject for a report in the 'Transactions.' This year notes have been prepared on the work with swedes, which were last referred to in 1934.

A swede variety is normally propagated by selecting and seeding in mass. In consequence there is often considerable variability in hereditary constitution, which might be reduced by some more strictly controlled method of breeding. The aim has been to explore the possibilities of breeding from single plants and to see whether 'pure lines' thus bred could form foundation stocks from which varieties of uniform type and enhanced value might be developed.

By inbreeding, greater uniformity can be obtained in shape and habit of shaw, colour, and to some extent shape of 'bulb,' though this last character is always greatly modified by the circumstances of growth. It is of chief importance, however, to see that the feeding value of the lines is at least equal to that of commercial varieties of similar type. The yield of a swede crop is not the only consideration. If it were there would be a decrease in feeding value from the large, early varieties to the small, late types. Actually, besides their greater hardiness, the later varieties contain increased concentrations of foodstuffs, which compensate for the lack of bulk. The simplest estimate of feeding value is to ascertain the amount of dry matter contained in the 'bulbs.' This includes all substances other than water, and is mainly composed of sugars. There is also some fibre, which is not likely to exceed the requirements of a ruminant, though the harder types of 'bulb' may have to be sliced.

Each winter some of the lines of swedes have been tested in yield trials and compared with commercial varieties of similar types. The material available for trial is to some extent determined by the seed-yield of the breeding plants, so that when seed-yield was low it was not possible to follow up the observations in as orderly a manner as might be wished. The yield trials may be divided into those with pedigree lines and those with strains out of crosses. The pedigree lines have originated as plants selected out of commercial varieties and have been continued by self-fertilisation of single plants for a number of generations. It is desirable to know how such lines compare with their parent varieties: (1) in feeding value; and (2) in distinctness of type. Trials in the last few years have shown that roughly a third of the lines were somewhat better, a third about equal, and a third inferior to their parent varieties. No outstandingly high yielders have yet been found. The distinctness of type depends on the nature of the selection, but where plants more or less typical of the variety had been originally chosen, the lines could best be described as reselected strains of the variety, containing less variation of type. In fact, the experiments seem to show that by carrying out line breeding on comparatively few typical plants a purified stock of a variety could be obtained with equal or even slightly improved feeding value. To be certain of the relative value of strains it is necessary, however, to repeat yield trials for several seasons. This has been done with a few of the lines.

Other yield trials have been devoted to comparison of strains selected out of crosses between swedes of various types. Here, besides comparing the total feeding value, it is necessary to consider the gross yield and the percentage of dry matter, since these indicate the type, whether large and soft or small and hard, to which the new strain should be assigned. The strains are not true-breeding, but the results point to which of them is likely to prove of value.

A question which has received considerable attention at the Station is whether to make the original selections with or without an individual test of dry matter. If plants are selected for size and appearance of bulb alone there is a risk that more often than not the resulting strains may prove to be of a softer type than is desired. An alternative method of selection is to choose more plants than are required, say a hundred, and to test these individually for dry-matter percentage and bulb weight; keeping only those which excel in both qualities. The damage caused by sampling frequently leads to the death of the plant through disease. But apart from this disadvantage parental dry-matter percentage and bulb weight provide unreliable forecasts of progeny value, and they have no great merit for that purpose. One or other quality is likely to have been enhanced in the parent by some chance of environment, so that though the progeny remains relatively high in one respect it falls off in the other. If the aim of selection were high dry-matter percentage alone, lines could readily be obtained by use of the test, but in practice these are valueless unless the bulb weight can be kept up as well. For mass selection the use of a preliminary dry-matter test may be of value, but for starting new lines it appears to be more profitable to dispense with the preliminary test and to make early observations on the dry matter of the line as soon as sufficient seed can be obtained to sow out plots of suitable size.

Other problems which are receiving attention include breeding for resistance to finger-and-toe disease and non-susceptibility to bolting. The inter-relationships of swede, turnip, and rape, and the origin and identity of the 'bulbless bolter,' are also under examination. Recently attention has been paid to the breeding of marrow-stem and thousand-headed kales, and these forms now constitute part of the 'root-crop' breeding programme.

THE WEST OF SCOTLAND AGRICULTURAL COLLEGE.

(a) MILK PRODUCTION DEPARTMENT.

Proven Sires.—The work on a study of the various "Bull Indices" is practically complete. This shows that no index yet prepared can be an absolute guide as to the value of a bull.

The average production of the daughters of a bull is as reliable an indication of his value as has yet been determined, but even this can be quite misleading. For example, there may be two bulls each with daughters averaging 750 gallons. In one case the dams of those daughters may have averaged 650 gallons and in the other 800 gallons. From the average production of their daughters these bulls would be given the same value, and yet there is no comparison between them.

In addition to knowing the average production of the daughters of a bull it is essential to know the production of the dams of those daughters. Then attention must also be given as to the range in production of the daughters. It is only in this way that it can be determined whether or not a bull is fit to mate to cows of good producing ability.

Skim Milk Powder for Calves.—A large-scale trial has been conducted in which sixty calves have been raised on skim milk powder after a start on whole milk. For comparison a group of six calves was raised on whole milk throughout. The trial lasted ninety days.

All calves had colostrum at the start and then whole milk. Starting at forty days of age the whole milk was gradually replaced by reconstituted skim milk. The maximum allowance was 1½ lb. skim milk powder, representing 15 lb. of skim milk per head daily. Hay, flaked maize, and various supplementary mixtures were also fed.

The calves on whole milk throughout made the satisfactory gains of 11·55 lb. per head per week. Those on skim milk powder also did relatively well, gaining 9·38 lb. per head per week.

Though the calves on skim milk powder made good gains they did not show the sleek coat condition of the calves on whole milk. This is generally to be expected where calves are changed from whole milk to skim milk at an early age. Whole milk gives a coat condition and general appearance that cannot be obtained with any other feed.

If calves are given a good start on whole milk and are changed gradually to reconstituted skim milk, good thrifty calves can be reared. The feeding should be done with care, however, and hay and a proper grain supplement must be provided.

Herring Meal.—Herring meal, even in large quantities, has no marked effect on the yield or fat percentage of the milk.

Temperature.—Data on the influence of byre temperature on the yield and quality of evening and morning milk are being studied.

(*b*) MILK UTILISATION DEPARTMENT.

Mastitis.—Mastitis still continues to exercise the greatest influence on the quality of market milk and on its suitability for manufacturing purposes. Of 500 samples of milk obtained during the year from individual cows in the College area 51 per cent were found to be definitely infected with mastitis. The remaining samples of milk examined represented the mixed milks from 491 farms supplying milks to five creameries in the South-West of Scotland. This survey, made at the request of a large dairy organisation, covered the milk of 20,000 cows and afforded for the first time reliable information on the general quality of the milk supply and on the relative proportion of herds in which mastitis is present in the South-West of Scotland. Only 7 per cent of the herds were regarded as being quite free from mastitis infection. The fact that 45 per cent of the mixed milks were found to be very heavily infected with mastitis indicates that the disease is very widespread, and there is little reason to believe that the position is in any way becoming less serious. In four of the five creameries the amount of normal milk did not exceed 6 per cent of the total milk received. The presence of even a slight infection in the udders of a few cows, such as was found in a large number of herds, constitutes a danger to the healthy members of these herds unless the strictest hygiene is exercised at all times in the byre and during milking operations.

Mastitis was found to be the predisposing cause of low fat and low solids-not-fat content in a number of milks rejected by creameries and dairymen owing to their failure to comply with the requirements of the Scottish Milk Marketing Board and the Sale of Milk Regulations.

Flavour Defects in Milk.—A number of flavour defects in milk arising from causes other than mastitis were reported. In one case the milk of a cow forming part of a small estate herd consistently produced bad butter. Special bacteriological examinations showed the presence of an intra-mammary infection of a staphylococcus possessing strong fat-splitting properties. The milk developed a markedly rancid flavour within twenty-four hours, and butter made from it was quite unusable. The case is of considerable interest, since the exercise of every possible care during the milking and the subsequent handling of the milk failed to eradicate the trouble. The only effective remedy was the immediate and thorough pasteurisation of the freshly-drawn milk.

A number of cases of burnt flavour and ropy milks were reported, while oxidised and oily flavours due to metallic contamination of the milk at some stage in its handling continue to appear from time to time.

Metallic contamination and unusual bacterial infections were on several occasions found to be the cause of rapid deterioration in commercial cream.

Butter.—The effects of feeding earth-nut cake and herring meal in increasing amounts on the flavour and buttermaking properties of milk were determined in a feeding experiment.

The inclusion of earth-nut cake in moderate amounts in the cow's ration resulted in a very full-flavoured butter, but excessive amounts of the cake gave an unattractive flavour to the milk, and in the butter a flavour suggestive of rancidity.

The feeding of herring meal may readily result in defective milk flavours unless the daily allowance of meal is restricted. Herring meal almost invariably gave a very firm butter, very pale in colour, and often tallowy or oily in flavour. The butters made from this group of cows fed herring meal in the ration showed a very marked tendency to favour mould development resulting in inferior keeping properties and rancidity during storage.

Commercial butter samples, reported as having poor keeping properties under normal storage temperatures, were found on examination to show the presence of fat-splitting bacteria of water origin and yeast and mould infection.

Cheese.—A number of cheese defects of a somewhat unusual nature were submitted for examination. A flavour defect, accompanied by openness in the texture in cheddar cheese, was found to be due to a heavy yeast infection, probably from an improperly managed starter or due to the exercise of insufficient care in the handling of the dairy utensils.

The discolouring of a white cheese by greyish-black patches was shown to be due to a rod-shaped organism which reproduced the defect when inoculated into the cheese milk.

The work on the bleaching out of annatto in coloured cheese was continued. Several organisms have been isolated which are capable of reducing the colour in special small-scale laboratory experiments.

Several of the commercial rennet samples submitted to the department for examination were found to harbour the organisms responsible for the production of serious flavour defects resulting from the putrefaction of the cured cheese. The use of rennet extract, which has been held over from a previous cheesemaking season, involves a very serious risk to the new season's cheese.

Special cultures, containing a combination of selected lactic organisms of the Yoghurt type, have been used as starters in the making of cheddar cheese by a modified technique with satisfactory results. It is felt that cheese made with this type of culture may prove an acceptable alternative to the sour milk preparations of therapeutic value for which many consumers have a definite dislike.

THE HANNAH DAIRY RESEARCH INSTITUTE.

KIRKHILL, AYR.

Nutrition.—A study of the protein requirements of dairy cows has shown that the existing feeding standard can be reduced by at least one-quarter (*i.e.*, from 0·6 to 0·45 lb. protein equivalent per 10 lb. of milk) provided the rations are judiciously selected. It has been found that, in general, the proteins derived from home-produced foods (*e.g.*, blood meal, fresh, dried, and ensiled grass, and bean meal) are of higher nutritive value than those derived from imported concentrates, such as earth-nut and linseed cake. The nutritive value of the proteins of spring and summer grass have been shown to be higher than that of late autumn grass.

Grass Conservation.—The commercial driers, which have been installed on the Institute's farm, have now been in operation for three years, and during this period a mass of information has been obtained regarding the costs of production and the practical difficulties involved in commercial grass drying. This information is now being collated, and it is hoped to issue a full report on the subject shortly.

Calf Feeding.—An extensive experiment has been carried out to determine the relative values of raw and pasteurised milk as a food for calves. The results failed to show any significant differences in the rate of growth on the two types of milk or in the 'condition' of the animals at the end of the experiment. Tuberculin tests and *post mortem* examinations of the calves revealed, however, a striking difference in the incidence of tuberculosis in the two groups. None of the calves fed on pasteurised milk showed any tuberculous lesions, but twenty-three out of thirty-six calves (or 65 per cent) fed on raw milk showed gross lesions of the disease.

Stock Management.—During the past five years a special study has been made of problems connected with the construction and equipment of cattle byres. Special attention has been given to the construction of byre floors, and recently a number of different types of rubber flooring have been tested. Rubber blocks and mats have proved unsatisfactory for various reasons, but satisfactory results have been obtained with certain types of rubber plastic flooring. As regards byre equipment, tubular fittings, although showing great advantages over the older types of equipment, have not been found entirely satisfactory. Experiments are in progress to determine how these disadvantages can be overcome.

Contagious Bovine Abortion and Mastitis.—Work has been continued into the various problems connected with the field control of these two diseases. Control measures against contagious abortion are being applied in some fifteen herds, and special methods have also been adopted in five other herds with the object of eliminating mastitis. Preliminary experiments have been made into the value of chemo-therapeutic treatment in cases of mastitis, and a new and relatively simple method of diagnosis is being investigated.

Methods of Testing Milk.—A special study has been made of the relative values of the plate count and the methylene blue reduction test for the routine testing of milk. Investigations so far completed show that the latter has certain outstanding advantages and that it appears to be at least as reliable an indication of cleanliness and keeping quality as the plate count. A new series of experiments on this controversial subject is at present in progress.

Canned Milk Products.—Investigations into the causes of bitterness and of discoloration in canned cream have been completed and the results published. Special attention is now being given to problems of storage of canned milk products, and particularly to the prevention of fat deterioration (rancidity and tallowiness) in full cream milk powders.

MACAULAY INSTITUTE FOR SOIL RESEARCH.

Craigiebuckler, Aberdeen.

The work carried out at the Macaulay Institute for Soil Research can, as previously, be divided into the following main groups: Soil Fertility Investigations and Advisory

Work; Soil Surveys and Geological Work; the Study of Peat Soils and Soil Drainage Investigations.

Soil Fertility Investigations and Advisory Work.—Information can be obtained from the Institute, free of charge, regarding the lime and manurial requirements of soils, and farmers are becoming increasingly interested in this branch of the Institute's work. During the year approximately 1500 samples of soil were examined and relative advisory reports issued. The Government's schemes for subsidising lime and basic slag are causing a very large increase in the number of inquiries received.

The soil fertility investigations have been continued on the same general lines as hitherto. The results of field and pot experiments are being correlated with laboratory methods, and in this connection a special series of experiments is meantime being conducted as part of a scheme of co-operative work on the estimation of available phosphate and potash in the soil. This work is being done by a Committee of the International Society of Soil Science under the direction of Professor Mitscherlich.

In addition to the work on phosphate and potash, experiments are also being conducted to study the effect and residual value of lime, and attention is also being paid to the problem of minor elements in soils.

Soil Surveys and Geological Work.—The soil survey of the eastern part of Kincardineshire has been continued.

Detailed mapping of the soils in the Huntly district has been completed, and laboratory examinations are being carried out. A rapid reconnaissance survey of the whole of Aberdeenshire has been undertaken in connection with the report of the Land Utilisation Survey.

The study of the 'brown earths' occurring on basic igneous parent materials continues, and a study of the chemical changes occurring on the weathering of basic igneous rocks is being undertaken.

The mineralogical examination of the drift deposits in Kincardineshire in connection with the survey has been completed. New methods for the examination of the finer material of the soil, involving both X-ray and optical determinations of the crystalline material in the clay complex, are being studied.

Peat Soils.—The work at the Macaulay Farm in Lewis has been continued and extended as far as financial resources would allow. The experiments on the improvement of moorland for grazing have been extended and are giving very promising results. It has been shown conclusively that without lime and phosphates no improvement of the moorland is possible.

During the year a scheme for breeding rams for crofters was started, the aim being to produce a better and more vigorous strain without losing the desirable qualities of the Lewis wool, or the hardiness of the Lewis sheep.

Work on the reclamation scheme in Lanarkshire, which was undertaken on behalf of the Commissioner for Special Areas, has been continued. Very satisfactory progress has been made. The drainage of a large area has been completed. Liming with paper-works waste lime and ground lime and manuring with basic slag and potash manure salts has been carried out with the aid of specially constructed implements.

After a considerable amount of experimental work suitable cultivating implements were obtained, and as an experiment about 25 acres were sown out in September. In spite of the lateness of sowing a good growth of grass was obtained. A large area will be ready for crop during the present year.

In the laboratory chemical analyses have been carried out and physical tests made with the object of establishing a connection between chemical composition and shrinkage.

Special Investigations.—The pasture investigations undertaken jointly with the Edinburgh and East of Scotland College of Agriculture on means of preventing the reversion of good pasture to poorer types have been continued.

An Indian research worker is meantime carrying out at the Institute a study of the relationship between the red and black soils of Hyderabad State.

Work is being continued in conjunction with the Animal Diseases Research Association in an attempt to establish a connection between a cattle complaint and the manganese content of the soil and pasture.

Joint experiments with the Forestry Commission are being continued.

Study of the Drainage Constitutents of the Soil.—The study of the composition of the drainage waters from the soils of the Craibstone lysimeters was continued during the year. The crop for 1937 was hay. Lysimeter No. I. received sulphate of ammonia at the rate of 4 cwt. per acre applied in April, July, and August. The usual collection, measurement, and analyses of the drainage waters has been continued.

MILK RECORDS.

Thirty-fifth Year—Records of 37,549 Cows.

By WILLIAM STEVENSON, B.Sc., N.D.A., N.D.D., Superintendent,
The Scottish Milk Records Association.

Systematic milk recording in Scotland was continued in 1937 under the direction of the Scottish Milk Records Association on the same lines as in 1936 and previous years. The scheme of private or unofficial milk records for unregistered herds inaugurated in 1924 was also continued during this year.

The Association in 1937 consisted of the following members :—

Name and Address.	Body Represented.
Mr T. Drummond, Craighead, Mauchline	Central and South Ayrshire Milk Recording Society (6 Circuits).
Mr William D. M'Cubbin, Lochlands, Maybole	
Mr William Niven, Estate Office, Sorn	
Mr William Wallace, Lyonstone, Maybole	
Mr George Templeton, Carnell Farm, Hurlford	Central Ayrshire No. 2 Milk Recording Society.
Mr William Bankier, Gartloch Farm, Gartcosh	Central Scotland Milk Recording Society (6 Circuits).
Mr William Fleming, Auldton, Ashgill	
Mr J. Pirie, Lennoxlea, Lennoxtown	
Mr George Stewart, The Drum, Bo'ness	
Mr J. Struthers, Anston, Dunsyre	
Mr R. R. Wardrop, Ditch Farm, Cambus	
Mr Alex. Y. Allan, Aitkenbar, Dumbarton	Dumbartonshire Milk Recording Society.
Mr Matthew Cochrane, Catlinns, Lockerbie	Dumfriesshire Milk Recording Society (3 Circuits).
Mr Robert Miller, Shawsholm, Closeburn	
Mr Mungo Sloan, Hunterhouse, Lochmaben	
Dr Chalmers Watson, Fenton Barns, Drem	East Lothian and Border Milk Recording Society.
Mr A. Dryburgh, Methilhill, Windygates	Fife Milk Recording Society (2 Circuits).
Mr Gilbert R. M'Garva, Estates Office, Colinsburgh	
Mr E. Ross, Castleheather, Inverness	Highland Milk Recording Society.
Mr Andrew Smith, Drumore, Campbeltown	Kintyre Milk Recording Society.

Name and Address.	Body Represented.
Mr John T. Kirkwood, B.Sc., N.D.A., Scorrieholm, Lesmahagow	Lesmahagow Milk Recording Society.
Mr John Wallace, Whitehills, Sorbie	Machars Milk Recording Society.
Mr Robert Laird, Lawthorn, Irvine	North Ayrshire (John Speir) Milk Recording Society (3 Circuits).
Mr J. M. Matthew, Girthill, Saltcoats	
Mr Thomas Murdoch, West Tannacrieff, Kilmarnock	
Rt. Hon. Lord Carnegie, K.C.V.O., Elsick, Newtonhill	North of Scotland Milk Recording Society (3 Circuits).
Mr J. D. Paton, Grandhome, Woodside	
Mr Robert Howie, Flatterton, Greenock	Renfrew and Bute Milk Recording Society (2 Circuits).
Mr John Telfer, Branchal, Bridge of Weir	
Mr Andrew M'Cartney, West Dykebar, Paisley	Renfrewshire (Upper Ward) Milk Recording Society.
Mr Andrew Cochran, High Ardwell, Kirkcolm	Rhins of Galloway Milk Recording Society (5 Circuits).
Mr John Forster, Mains of Larg, New Luce	
Mr A. M'Caig, Kilhilt, Stranraer	
Mr A. N. M'Caig, Challoch, Stranraer	
Mr J. M'Intyre, jun., Logan Mains, Ardwell	
Mr H. G. Baird, Kirkchrist, Kirkcudbright	Stewartry of Kirkcudbright Milk Recording Society (5 Circuits).
Mr George Barbour, Auchengibbert, Crocketford	
Mr T. Graham Clement, Howwell, Kirkcudbright	
Mr Walter C. Crawford, Chapmanton, Castle Douglas	
Mr Sinclair Watson, Viewfield, New Galloway	
Col. W. T. R. Houldsworth, Kirkbride, Maybole	The Ayrshire Cattle Herd-Book Society of Great Britain and Ireland.
Mr James Howie, Muirside, Holywood	
Mr John R. Miller, Midkelton, Castle Douglas	
Mr A. W. Montgomerie, Westburn, Cambuslang	
Mr James Kilpatrick, Craigie Mains, Kilmarnock	The British Friesian Cattle Society.
Mr John Telfer, Branchal, Bridge of Weir	
Mr W. P. Gilmour, Balmangan, Borgue	The Highland and Agricultural Society of Scotland.
Mr John W. Prentice, Craigrie Farm, Clackmannan	
Mr James Wither, Awhirk, Stranraer	
Mr James Dunlop, Midland, Prestwick	The West of Scotland Agricultural College.
Principal W. G. R. Paterson, 6 Blythswood Square, Glasgow	
Mr John N. Watson, Tarelgin, Coylton	
Mr A. Cunningham, D.Sc., 13 George Square, Edinburgh	The Edinburgh and East of Scotland College of Agriculture.
Mr A. M. Smith, D.Sc., 13 George Square, Edinburgh	

Name and Address.	Body Represented.
Mr Arthur R. Wannop, B.Sc., B.Eng., 41½ Union Street, Aberdeen	The North of Scotland College of Agriculture.
Professor J. Hendrick, Marischal College, Aberdeen	
Mr J. F. Tocher, D.Sc., 41½ Union Street, Aberdeen	
Mr John Forster, Mains of Larg, New Luce	Animal Diseases Research Association.
Mr W. Cassels Jack, Robiesland, Lanark	
Mr A. B. Fowler, B.Sc., Kirkhill, Ayr	The Hannah Dairy Research Institute.
Mr Norman C. Wright, M.A., Ph.D., Kirkhill, Ayr	
Mr Allan Barr, Hobsland, Monkton	Co-opted Members.
Mr Andrew C. M'Candlish, Ph.D., B.Sc., Auchincruive, Ayr	
Lord Rowallan, Rowallan, Kilmarnock	
Sir Hugh Shaw-Stewart, Bt., K.C.B., Ardgowan, Inverkip	
Lt.-Col. W. Guy Shaw-Stewart, Ardgowan, Inverkip	

Chairman—Mr Robert Howie.

The following were the principal members of the staff:—

Secretary and Treasurer—Mr John Howie.

Superintendent—Mr William Stevenson, B.Sc., N.D A., N.D.D.

Assistant Superintendent—Mr Percy H. Hart.

SCHEME OF OFFICIAL MILK RECORDS.

ADMINISTRATION.

In 1937, as in previous years, the scheme of official milk records was administered by the Association through local milk recording societies. The grant from the Treasury, obtained through the Department of Agriculture for Scotland, was continued in 1937 on the same conditions as in the previous year. The amount authorised was £2663, compared with £2619 for 1936.

Grants were allocated to local societies on the following scale :—

1. Societies testing at intervals of not more than twenty-one days :—

(*a*) The hire of the necessary milk-testing appliances free of annual charge, the society to upkeep the apparatus in good condition.

(*b*) An annual grant of 9s. 6d. per member towards the cost of surprise check tests.

2. Societies testing at intervals of from twenty-two to twenty-eight days :—

(*a*) The hire of the necessary milk-testing appliances free of annual charge, the society to upkeep the apparatus in good condition.

(*b*) An annual grant of 8s. per member towards the cost of surprise check tests.

During the latter part of 1936 and the earlier months of 1937 every effort was made to obtain new members for local societies throughout the various dairying districts of Scotland, and 66 definite applications were received. But for various reasons, such as members disposing of their dairy herds or removing from their farms, &c., there were a considerable number of resignations.

All the local societies which operated in 1936 continued in 1937. The Central Scotland Society, with five circuits, found it necessary owing to increase in membership to form a sixth circuit, to which three surplus members of the Lesmahagow Society were transferred. The Rhins of Galloway Society also decided to form a new circuit, increasing the number of their circuits from four to five. The number of recorders' circuits in 1937 was 43, two more than in the previous year. The number of herds officially tested was 835, and the number of cows officially tested, 37,549, an increase of 35 herds and 1335 cows from the previous year, and the largest number of herds and of cows tested in the history of the Association.

The following is a list of the milk recording societies which operated in 1937, with the name and address of the Secretary of each Society :—

Name of the Society.	Secretary.
Central and South Ayrshire (6 Circuits)	Mr E. A. Bell, M.A., B.Sc., 13 Alloway Street, Ayr.
Central Ayrshire No. 2 .	Mr James Caldwell, Moorfield, Kilmarnock.
Central Scotland (6 Circuits)	Mr Arthur Gilmour, C.A., 23 Silvergrove Street, Glasgow.
Dumbartonshire . . .	Mr Robert Bilsland, Quay Place, Dumbarton.
Dumfriesshire (3 Circuits)	Mr Thomas Henderson, Solicitor, Lockerbie.
East Lothian and Border .	Mr Andrew Young, W.S., 28 Queen Street, Edinburgh.
Fife (2 Circuits) . . .	Mr F. Dow, Commercial Bank, Thornton.
Highland	Mr J. M. Hunter, Queensgate, Inverness.
Kintyre	Mr Donald Armour, Machrihanish, Campbeltown.
Lesmahagow	Mr James Hamilton, Auldtoun, Lesmahagow.
Machars	Mr William Christison, Barglass, Kirkinner.
North Ayrshire (John Speir) (3 Circuits)	Mr John W. Goudie, Union Bank, Kilmarnock.
North of Scotland (3 Circuits)	Mr R. C. May, 77 Crown Street, Aberdeen.
Renfrew and Bute (2 Circuits)	Mr Thomas Hunter, Solicitor, 35 High Street, Paisley.
Renfrewshire Upper Ward	Mr William Henderson, Glyndusk, Caplethill Road, Barrhead.
Rhins of Galloway (5 Circuits)	Mr W. Brown Moir, 8 Bridge Street, Stranraer.
Stewartry of Kirkcudbright (5 Circuits)	Mr Patrick Gifford, Solicitor, Castle Douglas.

SEASON 1937.

The following table shows for each society or circuit the number of herds, the number of cows tested, the average interval between the tests, and the duration of the recording season :—

[TABLE.

	Name of the Society or Circuit.	No. of Herds.	No. of Cows Tested.	Average interval between Tests, in Days.	Duration of Recording Season, in Weeks.
	Central and South Ayrshire—				
1.	Ayr and Troon	21	747	26	52
2.	Cumnock and District	20	672	26	52
3.	Girvan and District	18	776	24	52
4.	Kilmarnock and District	19	769	25	52
5.	Mauchline and Drongan	20	646	26	52
6.	Maybole and District	18	840	24	52
7.	Central Ayrshire No. 2	18	700	24	52
	Central Scotland—				
8.	Carluke and District	19	701	25	52
9.	Dunblane and District	24	900	28	52
10.	East Kilbride and District	17	1006	23	52
11.	Falkirk and Linlithgow	20	633	25	52
12.	Strathaven and District	19	667	24	52
13.	Strathendrick	18	501	24	52
14.	Dumbartonshire	20	791	26	52
	Dumfriesshire—				
15.	Mid Annandale	24	1034	28	52
16.	Upper Annandale	23	1069	28	52
17.	Upper Nithsdale	24	970	28	52
18.	East Lothian and Border	19	948	25	52
	Fife—				
19.	Dunfermline and Kirkcaldy	23	926	28	52
20.	Cupar-Fife and Perth	22	788	28	52
21.	Highland	18	707	28	52
22.	Kintyre	9	377	28	52
23.	Lesmahagow	23	747	28	52
24.	Machars	22	1194	28	52
	North Ayrshire (John Speir)—				
25.	Fenwick	21	987	27	52
26.	'John Speir'	24	761	28	52
27.	Stewarton and Montgomerie	21	849	27	52
	North of Scotland—				
28.	Aberdeen, Kincardine and Angus	21	857	28	52
29.	Aberdeen, Moray and Banff	18	904	28	52
30.	Aberdeenshire	20	981	28	52
	Renfrew and Bute—				
31.	Bute and Inverkip	24	700	28	52
32.	Paisley and Kilmacolm	21	765	27	52
33.	Renfrewshire Upper Ward	14	692	28	52
	Rhins of Galloway—				
34.	Kirkcolm and District	18	1207	25	52
35.	Kirkmaiden and District	12	1167	26	52
36.	Luce Valley	16	978	23	52
37.	Stoneykirk and District	14	984	23	52
38.	Stranraer and District	13	1041	23	52
	Stewartry of Kirkcudbright—				
39.	Dalbeattie and New Abbey	19	930	25	52
40.	Castle Douglas & New Galloway	19	1118	25	52
41.	Castle Douglas and District	20	1090	26	52
42.	Kirkcudbright and District	21	1265	27	52
43.	Borgue, Twynholm & Gatehouse	21	1164	28	52
	Total No.	835	37,549	...	...

DEFINITIONS.

The milk records compiled by the Association are records of the estimated quantity of milk produced by each cow in a separate lactation, and of the estimated percentage of milk fat contained in the milk. For convenience a gallon of milk is reckoned as 10 lb. A gallon of milk of average quality weighs almost exactly 10⅓ lb. The following further particulars concerning each record were also given wherever possible :—

Name of cow, byre number, and herd-book number.
Sire of cow and herd-book number of sire.
Dam of cow and herd-book number of dam.
Date of birth.
Date of calving preceding opening of record.
Number of weeks in milk.
Date of calving after record closed.

The following particulars of the preceding record were appended to each record, where available :—

Date of calving preceding opening of record.
Quantity of milk in gallons.
Percentage of fat in milk.
Number of weeks in milk.

The milk yields were estimated in respect of quantity and milk-fat percentage from the results of systematic periodic tests by trained recorders approved by the Association. The recorders visited the farms for this purpose at intervals varying from twenty-one to twenty-eight days, and each day of visit was regarded as the middle day of the period covered by the test. Milk records estimated in this way approximate closely to the actual milk yields.

METHOD OF RECORDING—OFFICIAL RECORDS.

A distinctive feature of milk recording in Scotland in 1937, as in previous years, was that the official records were entirely the work of trained official recorders. Recorders had previously to undergo a special course of training in milk recording at the West of Scotland Agricultural College, or other approved College of Agriculture. Only candidates of good character and good general education were selected to attend these courses ; and all recorders, before appointment, were approved by the Executive Committee of the Association.

All dairy farmers taking advantage of the Association's scheme were arranged into Local Milk Recording Societies employing one or more recorders, the Executive Committee having the power to transfer members from one local society to another, in order to find accommodation for new applicants, and at the same time avoid overlapping of recorders' circuits. Each local society applying to the Association for licence to conduct milk recording under the Association's scheme signed the form containing the Association's rules and regulations, and agreed to conform to these rules. The local society selected and appointed their recorder or recorders from the list of approved recorders obtained from the Association. Apparatus, chemicals, sheets, and books were selected and arranged for by the Association, all byre sheets and record books used by the recorders being supplied free of charge. Thus uniformity of method was, as far as possible, assured.

The official recorder visited each herd at intervals of not more than twenty-eight days, or more usually from twenty to twenty-five days. He, or she, arrived at the farm in the afternoon, usually by means of a small pony and trap provided by the local society for the purpose, and was accommodated at the farm overnight. All cows giving milk in each herd, as far as was possible, were included in the records. Each cow was clearly distinguished in the byre by a stall number on the wall, immediately in front of and above the level of the cow, and registered animals were also indelibly tattooed on the ears with distinctive registered tattoo markings. The cows were milked in the same rotation, evening and morning, on the occasion of the recorder's visit. The recorder weighed and sampled the milk of each cow in the evening, noting the time at which each cow was milked, and entered the results in the corresponding columns in the byre sheet, taking up a position in the byre as near to the milkers as possible, so as to have them in full view, and, as far as practicable, receiving the milk direct from the milker at the cow's side. He again weighed and sampled the milk of each cow in a similar manner in the morning, and entered the results in the byre sheets. He then tested the mixed evening and morning sample for each cow by the Gerber method for percentage of milk fat. He entered in the byre sheet any unusual conditions likely to affect the milk yields. The recorder was required to see that all milk samples and byre sheets were securely locked up overnight or during his absence. From the daily results the recorder calculated and completed the byre sheets, multiplying the yields by the exact number of days which had elapsed since the last test, but so calculating throughout that each day of visit was regarded as the middle day of the period covered by the test. Special ready-reckoners were used to facilitate calculating and to ensure greater accuracy.

The byre sheets were written out in duplicate. The principal copies were posted at regular intervals to the office of the Association, and the second copies left with the respective members. The recorder transferred the results from the extended byre sheets to the milk record book for the herd indelibly in ink, each cow being assigned a separate page, at the top of which full particulars of the cow were entered, including the indelible tattoo marks on the animal.

The byre sheets were carefully revised and corrected in the Association's office during the season, and a list of the necessary corrections sent to each recorder periodically to be entered in the record books.

Visits of inspection were made to each recorder and to the members of local societies at the different farms periodically throughout the year by members of the Association's staff, and reports thereon submitted to the Executive Committee. The Executive Committee reserved the right to withdraw approval of any recorder at any time, or to limit the period of service of any recorder with any particular society. Members of local societies refusing to observe any of the rules of the Association, or deemed to be guilty of conduct injurious to the true interests of milk recording, were liable to be temporarily or permanently suspended.

Another distinctive feature was the surprise check tests, the records of each herd being checked in this way about two times throughout the year. The recorder was instructed, by a letter from the superintendent on a date unknown to recorder and owner of herd, to remain at the same farm another day and make another complete twenty-four hours' test. The surprise test results were entered on special buff-coloured byre sheets, and in the record books in red ink immediately below the results of the regular test of the previous day. The buff byre sheets were posted to the Association's office with the other sheets, and any abnormal differences were immediately noted and were reported to the Executive Committee.

As a result of this system of surprise check tests, each page of the 1937 milk record books contains entries in red, comparison of which with the immediately preceding entries provides valuable evidence as to the genuineness of the milk records.

In addition to the surprise check tests made by the recorder, a number of independent surprise tests were made by the Association's staff in order to check the recorder's work.

All records were closed at the end of December, the current lactations being carried forward to the new books of the following year. Finally, summary sheets were written out in duplicate showing the total milk yield for each cow for the lactation or part lactation, with full particulars of the cow, dates of calving, &c. The principal copy of the summary sheet was posted to the Association's office with the record book, and the second copy left with the owner of the herd.

All record books and summary sheets were carefully revised, corrected in detail, and initialled in the Association's office during the next few months, the record books being returned later to the respective members, and the summary sheets retained and bound for future reference.

The milk records were next classified into three groups for cows and heifers respectively on the following basis. Experience has confirmed the view that the most useful comparison is obtained by reckoning the yields in terms of pure butter fat. Such a comparison takes into consideration both the quantity and the quality of the milk.

Cows with a milk record equivalent to not less than 280 lb. of butter fat, and heifers with a milk record equivalent to not less than 224 lb. of butter fat, were grouped into Class I. Cows and heifers with milk records of less than two-thirds of these amounts—viz., 186 and 149 lb. of butter fat respectively—were grouped into Class III.

The following short table shows the corresponding values of these yields in fairly good milk of 3·5 per cent milk fat:—

Class.	Yield of Butter Fat. (Lb.)	Corresponding Yield in Milk of 3·5 per cent Fat. (Gallons.)
Cows in Class I. . .	Not less than 280 .	800
Heifers in Class I. .	Not less than 224 .	640
Cows in Class III. .	Less than 186 . .	531
Heifers in Class III. .	Less than 149 . .	426

All cows and heifers with milk yields falling between these limits would come into Class II. Such animals naturally claim less attention than the good milkers or the obviously unprofitable animals. It should be noted, however, that Class II. would include a certain number of unclassifiable yields, as there were a number of cases where, from various causes, the results of a whole normal lactation could not be obtained.

It should be noted that while the above standards for classification of milk yields are the same as for 1934 onwards, they are higher than those formerly adopted, in the proportion of 280 lb. of butter fat for a Class I. cow to the former standard of 250 lb., the other standards bearing the same relation as formerly to the cow Class I. standard. This decision of the Executive Committee brought the Class I. standard for cows and heifers respectively into line with those adopted since 1924 for the Association's Annual Register of

High-yielding Cows. This subject was dealt with more fully in the 1934 report under "General Review."

The Association will shortly publish an annual report giving fuller details of the work of the Association and of each local milk recording society during 1937. This report will include tables showing for each farm the number of cows and heifers tested, and the number and percentage included in Classes I. and III. respectively. Each herd is included under the respective local society, but is represented only by an alphabetical letter, the owner being advised privately of the identity in the report of his own herd or herds. From these tables any member may see how his herd compares with other herds in the same or any other district, and the improvement in his own herd compared with previous years. The report will also show in tabular form the percentage of Class I. and of Class III. animals of all animals tested under the Association's scheme during the year, and will thus afford a valuable indication of the progress in milk production generally in recorded herds.

An important feature of the Association's annual reports, from 1917 inclusive, is the register of good milking cows with the names and addresses of owners and full particulars of the milk records. This register includes only the records of animals with a milk yield equivalent to not less than 280 lb. of butter fat in the case of a cow, and 224 lb. of butter fat in the case of a heifer, and is further restricted to animals which completed their lactations before the end of the year and gave birth to another calf before 1st May 1938. Full particulars of each record are given, and all lists of records are submitted to the owners of the respective animals for revision before publication. The register is of great value to all interested in improved milk production and in the breeding and rearing of animals of the best milking strains, and is invaluable for reference.

It should always be kept in mind when making a comparison of cows in different herds or in different districts that the different methods of dairying practised have a considerable influence on the milk yields, and that therefore milk yields alone do not necessarily indicate the true relative inherent or hereditary milking qualities of the animal. But the authenticated milk records compiled by the Association are of inestimable value to breeders and owners of dairy cows if properly interpreted.

REVIEW OF 1937—OFFICIAL RECORDS.

Recording was carried on in 1937 by 43 local societies or circuits, comprising 835 members. The number of cows tested in 1937 was 37,549, compared with 36,211 in 1936, and was the largest number officially tested in the history of the Association.

During the year 18 recorders, for various reasons, terminated their engagements. The Executive Committee, however, in the same period approved of 24 applicants for the position of milk recorder, and were able to recommend a sufficient number of qualified recorders. Four women recorders were employed in 1937 and 54 men recorders. In this connection the Committee are indebted to the West of Scotland Agricultural College for giving special courses of instruction for milk recorders to meet the Association's requirements. Two special courses were required in 1937, one in July and the other in December. Twenty-five selected candidates attended, and 19 obtained the certificate.

The Executive Committee purchased the supplies of milk-testing apparatus, sulphuric acid, and amylic alcohol for local societies, as in previous years.

The system of surprise check tests, introduced in 1920, was continued in 1937. The total number of check tests made by recorders during the season was 1053. In no instance in 1937 was the average milk yield for the herd more than 3 lb. milk daily less on the occasion of a check test as compared with the previous day. Only 7 herds showed an average of over 2 lb. less. In addition to the surprise tests arranged for and carried out by the recorders, the Assistant Superintendent made 51 special check tests of different herds. The results in most instances agreed very closely in regard both to average milk yields and fat percentages with those of the recorders' previous tests. Only 5 herds showed an average daily yield of over 2 lb. less on the occasion of a special check test, and only one herd had an average of over 2 lb. more. With regard to average fat percentages, only 2 herds showed an average fat percentage of over ·2 per cent lower, and 2 herds an average of over ·2 per cent higher. With the exception of 4 herds, the average fat percentages were all within ·2 of those obtained by the recorders at the previous tests.

With regard to the general conditions for milk production in 1937, the weather during the first fortnight of April was wet and cold ; the last fortnight was, however, drier and more genial in most districts. During the first half of May the weather was generally dry, with a good deal of sunshine, while in the second fortnight there was a considerable rainfall, with a fairly high temperature. Warm weather was general during the first two weeks of June, but during the latter part of the month temperatures were lower, and cold northerly winds checked growth to some extent. Exceptionally heavy rain fell during the first week of July, particularly in the eastern districts, and for the next fortnight the weather was generally dull, wet, and cold. Towards the end of the month the weather was warm and bright. During the earlier part of August the weather in most districts was dry and warm, although rather dull; later there were frequent showers, which interfered to some extent with harvesting operations. The weather was fine and dry in most districts during September, though heavy rain and unsettled weather prevailed in a few districts during the first half of the month. Exceptionally favourable weather prevailed generally throughout the month of October, and the grain harvest was completed under satisfactory conditions.

Grasses and clovers, although somewhat backward as compared with an average year, made rapid progress during the latter part of April; and by the end of May growth was abundant. But wet weather conditions during July had an adverse effect on the hay crop, and the work of haymaking was difficult and protracted. Yields generally were considerably above those of an average year. Pastures throughout the country were very bare at the end of March, and fodder supplies were not too plentiful. During May, however, pastures made good progress, and by the end of the month grass was plentiful. The sowing of turnips and swedes was well advanced in many districts by the end of May. Where sown early plants generally maintained steady progress, but later sowings made slower growth. The crop was bulky, but in many districts it was of poor quality owing to the prevalence of disease.

In the case of recorded herds, other conditions militated against a higher average milk yield. As in recent years, a considerable proportion of herds which had been recorded for a period of years were entirely dispersed, or for other reasons already referred to did not continue to be recorded, while an unusually large number of 'new herds,' or herds tested for not more than three years, were included. The proportion of regular milk record herds was thereby correspondingly reduced. Also a considerable number of recorded herds were in process of being 'cleaned up' with regard to tuberculosis.

The following table shows for each society or circuit the number and percentage of cows and heifers of each class in 1937 :—

Society or Circuit.	Cows and Heifers.				
	Number.			Per Cent.	
	Total.	Class I.	Class III.	Class I.	Class III.
Central and South Ayrshire—					
1. Ayr and Troon	747	519	11	75	2*
2. Cumnock and District	672	562	6	84	1
3. Girvan and District	776	536	14	69	2
4. Kilmarnock and District	769	633	6	82	1
5. Mauchline and Drongan	646	489	6	77	1*
6. Maybole and District	840	630	22	75	3
7. Central Ayrshire No. 2	700	600	...	89	...*
Central Scotland—					
8. Carluke and District	701	468	12	73	2*
9. Dunblane and District	900	571	12	76	2*
10. East Kilbride and District	1006	617	33	62	3*
11. Falkirk and Linlithgow	633	370	20	64	3*
12. Strathaven and District	667	394	29	61	4*
13. Strathendrick	501	296	10	59	2
14. Dumbartonshire	791	512	16	65	2
Dumfriesshire—					
15. Mid Annandale	1034	625	29	64	3*
16. Upper Annandale	1069	585	46	60	5*
17. Upper Nithsdale	970	674	35	70	4*
18. East Lothian and Border	948	564	46	62	5*
Fife—					
19. Dunfermline and Kirkcaldy	926	616	8	69	1*
20. Cupar-Fife and Perth	788	525	9	71	1*
21. Highland	707	367	24	56	4*
22. Kintyre	377	161	14	59	5*
23. Lesmahagow	747	503	30	71	4*
24. Machars	1194	607	61	51	5*
North Ayrshire (John Speir)—					
25. Fenwick	987	638	12	70	1*
26. 'John Speir'	761	482	13	68	2*
27. Stewarton and Montgomerie	849	583	14	75	2*
North of Scotland—					
28. Aberdeen, Kincardine and Angus	857	598	6	70	1*
29. Aberdeen, Moray and Banff	904	551	23	61	3
30. Aberdeenshire	981	546	20	65	2*
Renfrew and Bute—					
31. Bute and Inverkip	700	329	42	54	7*
32. Paisley and Kilmacolm	765	462	24	65	3*
33. Renfrewshire Upper Ward	692	450	17	66	3*
Rhins of Galloway—					
34. Kirkcolm and District	1207	601	61	52	5*
35. Kirkmaiden and District	1167	576	79	49	7
36. Luce Valley	978	517	66	53	7
37. Stoneykirk and District	984	482	50	49	5
38. Stranraer and District	1041	464	79	45	8

Society or Circuit.	Cows and Heifers.				
	Number.			Per Cent	
	Total.	Class I.	Class III.	Class I.	Class III.
Stewartry of Kirkcudbright—					
39. Dalbeattie and New Abbey	930	415	78	45	8
40. Castle Douglas and New Galloway . . .	1118	665	46	59	4
41. Castle Douglas and District	1090	338	94	36	10*
42. Kirkcudbright and District	1265	655	43	52	3*
43. Borgue, Twynholm and Gatehouse . . .	1164	695	41	61	4*
Of all the cows and heifers tested in 1937	37,549	22,471	1307	62½	3½*
Comparison with 1936 .	36,211	22,564	1051	64¼	3*
Comparison with 1935 .	34,872	20,567	1200	61	3½*
Comparison with 1934 .	32,905	20,164	998	63	3*
Comparison with 1933 .	32,456	19,631	1061	62	3¼*

* Excluding herds tested during only a part of the recording season—1600 cows in 1937.

Reviewing the results of the 43 circuits as a whole, we find that, classifying on the new higher standards, of the total of 37,549 cows and heifers tested in 1937, excluding 1600 animals in herds tested during only a part of the season, and therefore not classified, 22,471 were included in Class I. and 1307 in Class III. This is equivalent to 62½ per cent in Class I. and 3½ per cent in Class III. Thus, 62½ per cent of all the cows and heifers tested gave a milk yield equivalent to not less than 800 gallons containing 3·5 per cent milk fat in the case of a cow and 640 gallons in the case of a heifer; while only 3 per cent gave a milk yield equivalent to less than 531 gallons containing 3·5 per cent milk fat in the case of a cow and 426 gallons in the case of a heifer.

The following table shows a comparison of the average results from 1914 to 1935 inclusive. For this comparison the milk records were classified on the lower standards adopted in previous years :—

[TABLE.

Year	Cows and Heifers		
	Total Number Tested	Per Cent	
		Class I	Class III.
1935	34,872	73	2
1934	32,905	75½	1½
1933	32,456	75	1¼
1932	31,415	72½	1½
1931	30,576	72¼	1½
1930	30,720	70	1¼
1929	30,898	68	1¾
1928	30,293	66	2½
1927	29,459	65¾	2¾
1926	29,236	65½	2¾
1925	28,410	60	5
1924	27,957	65	3
1923	26,952	65	2
1922	27,275	63	2
1921	26,752	58¼	4
1920	24,191	55¼	3¼
1919	20,786	49½	4½
1918	17,827	49	5½
1917	19,564	50	4¾
1916	22,702	53¼	4¾
1915	26,572	46	6
1914	26,424	39½	9

The average standard attained in 1937 was undoubtedly lowered by the inclusion of the larger proportion of 'new herds,' and by other adverse conditions already referred to, yet it will be observed from the preceding table that the proportion of animals qualifying for inclusion in Class I. in 1937 is only 1¾ per cent lower than that of 1936—namely, 64¼ per cent, which, taking into consideration the higher standards now adopted, is the highest reached since the commencement of official milk recording thirty-four years ago.

It will be observed also that when classified on the lower standards previously adopted the proportion of Class I. cows and heifers to the total animals tested increased from 39½ per cent in 1914 to 75½ per cent in 1934, while the proportion of Class III., or obviously unprofitable, animals was reduced in the same period from 9 per cent to 1½ per cent. These figures indicate great improvement in recorded herds, yet do not represent the full extent of the progress made since the introduction of milk recording in 1903. It is estimated that milk record herds generally are at the present time giving higher average yields than unrecorded herds to the extent of considerably over 200 gallons per cow per annum.

Improvement from milk recording is not confined to herds officially recorded in 1937. A very much larger number have been tested and recorded for longer or shorter periods since the Association's scheme of milk recording was introduced. And when we consider the spread or diffusion of the benefits arising directly or indirectly from milk recording, we find that these penetrate widely in various directions other than that of individual members of milk recording societies. For example, there is the effect on the remaining dairy herds of the country. The wide dissemination annually of milk record stock bulls and milk record cows for breeding purposes among untested herds alone must exercise an incalculable improving influence on a very large number of these herds. Such influence is increasing with the extension of the practice of using only milk record bulls in dairy herds.

There is also the powerful educational influence and force of example permeating and leavening the whole mass of dairy farmers. If a census could be taken in this connection, it would probably be found that a considerable proportion of herd owners outside the membership of milk recording societies are in one way or another testing and recording the milk yields of their herds who would never have done so had systematic or official milk recording not been in operation. The same consideration applies to the more enlightened methods of selecting, breeding, and feeding on milk record lines which have been adopted in many herds not officially recorded.

There is another direction in which advantage from milk recording is penetrating widely beyond the ranks of milk recording societies. Increased efficiency in the production of milk lowers the cost to the urban populations, and some portion of the return from milk recording is handed on beyond the actual milk producers.

There remains a still wider aspect of the question. Large numbers of milk record bulls and young cows are exported annually, and go to maintain and improve the milking qualities of the dairy herds of the Empire.

The Association's activities are not confined to the official testing and recording of the individual milk yields, but are directed also to assisting the herd owners to improve their methods of production by means of the records obtained. The work is to some extent of an educative or advisory nature. Official recorders have to attend a course of instruction which includes the feeding and general management of the dairy herd, and are required to do all they can to interest and advise members in this connection. The Association have prepared and issued to all members a concise practical guide to feeding of dairy cows, containing a table of fifteen selected food mixtures adapted to different conditions, and recorders and central staff take every opportunity of assisting members to follow the instructions given therein.

SCHEME OF PRIVATE OR UNOFFICIAL MILK RECORDS.

The Association's scheme of private or unofficial milk records, inaugurated in 1924, was continued in 1937 on the same lines as in previous years. The chief objects are to establish milk recording on a wider and more popular basis, and to induce a greater number ultimately to adopt the system of official authenticated milk records.

Milk recording under this scheme was administered directly by the Association. The following inducements were offered to members:—

(*a*) The hire of a set of appliances for testing purposes free of annual charge, the member to upkeep the apparatus in good condition.

(*b*) Byre sheets and record books free of charge, with stamped addressed envelopes for return of byre sheets.

(*c*) All calculations in byre sheets and record books to be made in the Superintendent's office, and the sheets and record books to be returned to the herd owners duly extended and completed.

(*d*) The total charge on members to be limited to an annual subscription to the Association at the rate of 1s. per cow tested.

Seven new members were enrolled for 1937. Four of the members and two former members were transferred to the scheme of official recording. The total membership for 1937 was 75, and the total number of cows included 1810. This new scheme of recording had at the end of 1937 been the means of obtaining for official recording 63 new members of a very desirable type, which is one of the objects for which it was promoted.

There are several reasons why the membership under this scheme has not increased in recent years. The better milking herds are gradually transferred to official records. Further transfers have been arranged for season 1938. At the other extremity there are a considerable proportion of poor herds, the owners of which are evidently unduly discouraged by the low yields recorded, and apparently have not the mentality to appreciate the possibilities of effecting the much-needed improvement. Also, a number of members, after two or three years' experience, believe they can carry on recording on similar lines independently at smaller cost.

This scheme of unofficial recording is serving a useful purpose. For reasons already given, its effect must not be measured merely by the number of herds included in any particular year; account must be taken of its educational influence and propaganda value. Thus a considerable proportion of the members who have withdrawn, and meantime severed their connection with the Association, have acquired the milk recording point of view, and ought ultimately to be found among members of milk recording societies. No fewer than 434 herd owners have been initiated in milk recording through its operation.

The following is a brief outline of the method of recording adopted:—

All cows in the herd yielding milk must be included in the record. Each cow must be clearly distinguished in the byre by a stall number on the wall. On the occasion of a test the cows must be milked in the same rotation evening and morning, and care must be taken that the milk of each cow for twenty-four hours, and for twenty-four hours only, is included in the test. The owner, or his agent, is required to weigh the milk of each cow evening and next morning by means of the spring balance and pail provided, once every twenty-one to twenty-eight days, and to enter the results and other necessary particulars in the byre sheet provided by the Association; and each byre sheet must be signed by the owner, or on his behalf, as correct in respect of all entries made. The byre sheet is sent by first post to the Superintendent, and calculated and extended by the Association's staff, and returned to the owner as soon as completed. A milk record book for each herd is written out in the Association's office. The record books are closed at the end of the recording season as at 30th November, and the results summarised and entered in special summary sheets. The record books and copies of the summary sheets, when completed and checked, are sent to the respective owners of the herds.

It must, of course, be clearly understood that the milk records compiled under this scheme are purely unofficial unauthenticated records, and have no connection with the official authenticated milk records of the Association. But from letters received and opinions expressed by members, it is evident that very useful guidance may be obtained from the records.

PROSPECTS FOR 1938.

Propaganda on an extensive scale is carried through each year. Applications for membership, or for further particulars, are invited through Press advertisements, articles, circular letters, broadcast talks, bills posted at auction marts, &c. All members of the Association, members of local milk recording societies, members under the scheme of unofficial records, and milk recorders are requested individually to assist in obtaining new members for either scheme in their respective districts, and to send to the Superintendent the names and addresses of local dairy farmers likely to be interested. In this way a comprehensive propaganda list of possible new members is compiled. To each address on this list are sent circular letters and propaganda literature giving particulars of both systems of recording and enumerating the advantages to be obtained, and a form of application. Following on the distribution of literature, personal visits are made to most of the farms by the Association's staff, and the herd owners are classified into three groups according to the degree of probability of their becoming members. Wherever any particular interest is shown, the visit is repeated until a definite decision is reached. By this method, continued over a number of years, dairy farmers who were formerly quite indifferent have been enrolled as new members.

Similar efforts were made to obtain additional applications for membership of local societies in 1938. With the scheme of private or unofficial milk records in operation, it was possible to carry out propaganda work for both schemes simultaneously, and over 2000 circulars and other letters, with propaganda literature, were distributed to dairy herd owners throughout Scotland. In addition, 892 personal visits were made. The number of new members for official records for season 1938 obtained to date is 82, and a considerable number of prospective new members for the year following have also been obtained.

All the local societies of 1937 have continued. The Central and South Ayrshire Society, with six circuits, found it necessary owing to increase in membership to form a seventh circuit. The number of recorders' circuits in 1938 is 44, one more than in the previous year. The total number of herds and of cows officially tested will also show increases.

The Committee are in a position to recommend a sufficient number of qualified recorders. All vacancies at the beginning of the year have been filled, and there remain a number of approved recorders on the waiting list. The Committee have arranged for supplies of sulphuric acid, amylic alcohol, and milk testing apparatus for local societies in 1938.

With regard to unofficial records, 15 new members have been enrolled. Five of the members have been transferred to the scheme of official recording for season 1938, making a total of 68 transferred. The total membership for unofficial recording at present is 73, with approximately 1680 cows.

General Review.

Much has been heard of Germany in recent years, and of her economic progress under a new system of Government. The holding of the great Eleventh World's Dairy Congress in Berlin in 1937 has drawn further attention to that country. We attended the Congress as a delegate from the Scottish Milk Records Association; and it may be of interest to give here in the limited space at our disposal our impressions of the Congress generally and of the present state of the German dairy industry, such as could be gained during a seven days' visit under the circumstances enjoined by attendance at the Congress. We avoid as far as possible the use of tiresome statistics, and deal only in a general way with the matters claiming our attention. If wrong impressions are conveyed we plead the shortness of our visit, the limited opportunities, and the difficulties with the language.

We refer only briefly to the Congress proper. A number of articles descriptive of this Congress have already appeared in various publications in this country, and a comprehensive official report has been printed and issued. The object of these Congresses is the advancement of the dairy industry in all countries. With this end in view, dairy specialists in both the scientific and practical sides of the industry were invited to attend for the purpose of discussing and exchanging views on problems of common interest; and elaborate arrangements were made for the convenience and entertainment of the delegates and other members, including the ladies attending the Congress or accompanying the members.

The eleventh Congress was inaugurated in the Kroll Opera House, Berlin, on Sunday, 22nd August, in the presence of representatives from 53 countries. The total number of members was 3760, of whom 225 were from Great Britain. The Kroll was decorated with the flags of all nations, and the building was full to overflowing when the Congress was opened. In the course of the proceedings the Reichminister for Food and Agriculture said that it was through the valuable assistance of the members of the International Dairy Federation that the Government of the Reich had been able to organise the present Congress. He expressed his great pleasure that the numerous scientific subjects upon which papers had been invited had aroused such great interest throughout the world, and thanked the authors of the 400 articles for their valuable contributions.

During the mornings of Monday to Thursday the various papers submitted were discussed; and for the afternoons of these days tours were arranged to enable members to visit farms, dairies, factories, and other places of interest to them, historic and otherwise. In addition, special conducted tours were arranged for the ladies.

The work of the Congress was divided into four sections, under the headings: Milk Production, Tropical Dairying; Milk Processing and Treatment; Legislative, Sale, Marketing, Business Management, and Dairy Education; Dairy Machinery, Buildings, and Transport. All papers submitted under each section were previously summarised by one or more persons appointed to this work. In view of the limited time at the disposal of the Congress, and the very large number of papers sent in, only the general summary was read out, and the time for discussion was strictly limited by the section management. All material read out was presented in three languages, German, French, and English. It was evidence of the elaborate organisation for this Congress, and of great convenience to members and saving of time, that provision was made for each member having head-phones by means of which he could listen in to whichever of the three languages he desired, the three languages being used simultaneously.

An International Dairy Exhibition was organised in conjunction with the Congress, under the direction of the Reichminister for Food and Agriculture, in the vast exhibition halls recently built at Witzleben. This was opened on Saturday, 21st August, and continued till 29th August. The exhibition was on a very large scale, and served to show in a comprehensive manner the high state of development which the modern dairy industry has attained in all civilised countries. All dairy matters pertaining to production, processing, and marketing were illustrated in the exhibition. A special section was devoted to showing the relative importance of the dairy industry in various countries, special stands being made available on request for each country taking part. In the section for cattle, seven German breeds were shown; three of these were of the lowland dairy type, while the remaining four represented highland cattle.

A special feature and innovation was the International Quality Show for Butter and Cheese, in which about 20 countries participated. The judging was carried out by international experts appointed by the National Committees. In view of the fact that this was the first occasion on which an international test of this kind was carried out, the results obtained were not published; only the National Committees were informed of the number of points secured by the samples of their respective countries. The entries were cold stored in large halls, and were in full view of visitors; and sampling and testing could be carried out by any member of the Congress up to the last day of the exhibition. We were impressed by the uniform excellence of the exhibits of the large range of varieties of produce from the various countries. Undoubtedly great progress has been made in this respect in practically all dairying countries in recent years.

The Organising Committee, with their Secretary, Herr Clauss, are to be congratulated upon a most successful, instructive, and interesting Congress and Dairy Exhibition, which had been well organised in every respect. The papers submitted and the various exhibits at the exhibition ranged over every aspect of dairying production, marketing, economics, engineering, transport, science, art, propaganda, hygiene, nutrition, quality testing, &c. The kindness and lavish hospitality of our German hosts greatly impressed everyone. It was matter for regret that more time was not available to do fuller justice to all that was provided to interest, enlighten, and entertain the visitor. On the other hand, all papers submitted to the Congress have already been published in three weighty volumes, and distributed to members together with summaries in German, French, or English. These constitute a veritable encyclopædia of dairying, and should provide ample material for digestion over the next three years, until the next World's Dairy Congress.

The interest of the visitor to an international Congress naturally centres in the country where the Congress is held. Between the years 1929 and 1933 German industry suffered a very severe depression. Agriculture was reduced to a state of almost utter poverty, and the foundation of a sound dairy industry was destroyed. There was a serious reduction in the number of milk cows, and much valuable work in cattle breeding, the results of several decades of testing and experiment, was almost entirely lost. It was realised that drastic and immediate measures were necessary to save the country from political disaster and economic ruin. In contrast to this condition of a few years ago a wonderfully controlled evolution is going on in the Reich to-day. The object is to raise the State to the highest grade of efficiency in the struggle for existence which takes place between states as between other organisms.

There is a marvellous degree of organisation, and concentration of power in particular individuals. The Supreme Head of the State is the Führer, Adolf Hitler, and each great Department of State has its own personal head, subordinate only to the Führer. Even the individual cities are each controlled not by a municipality in our sense but by a supreme official. In the Reich to-day these superior officials are free of those trammels in the form of Committees, Boards, and Councils which in our country we are so familiar with as delaying and often paralysing the efforts of the executive expert. In agriculture very incisive measures have been adopted to improve the breeding quality of the animals and their production, including compulsory milk recording.

There is an unmistakable air of activity and progress. Besides rearmament, the German Government have proclaimed another purpose to which business people and their employees have to dedicate themselves. This is the programme of national self-sufficiency in food and raw materials—including cattle foods—designed to reduce the import bill which Germany has to meet every year. In 1936 Germany produced 85 per cent of her butter and 89 per cent of her cheese. Being a Government of authority they have been able to cut down the costs of production in all sorts of directions. Prices are strictly controlled; and a special corps of officials have to see that no industrialist or tradesman sells at over the permitted prices.

The situation of Germany in the centre of Europe governs the climatic and natural conditions, which are important factors in the development of the dairy industry. Topographically, Germany forms five regions—the Coast Belt, on the coasts of the North Sea and the Baltic; the Lowlands in North Germany; the Central Mountain Belt; the Sub-Alpine Belt; the Alpine Belt. As a consequence of soil and climate the North Sea coastal belt is almost entirely used for grassland farming, while along the Baltic coast mixed farming predominates. The lowlands of North Germany are covered with sand, loose stones, loam, or clay. Practically the whole of Northern Germany forms one broad sandy plain; there is nothing approaching to a hill. The Central Mountain Belt yields mainly sandy soils of low fertility, but to the south lies what was once a broad ocean depression and is now dry land covered with gravel, sand, loam, and glacial deposits; here the soils are fertile, though in many parts very permeable to moisture. About one-third of German soil is found to be not suitable for agriculture, while much of the remaining soil is of a poor, dry, sandy, or gravelly nature. Rainfall is not too plentiful in most regions. Last season was abnormally dry, and in consequence grain crops were generally light. Indeed Germany has had several poor or moderate grain harvests in recent years. Climate ranges from the icy cold of winter with the biting winds from Russia sweeping over the wide sandy plains to the warm sunshine and clear blue skies of summer.

Holdings of medium size or smaller predominate in Germany, varying from 12 to 250 acres. But in South-West Germany small holdings of less than 12 acres are the more numerous. Dairy farming is one of the chief branches of the agricultural industry; the proceeds from the sale of milk and dairy produce are slightly greater than those from the turnover of grain. Milk production is largely in the hands of the peasants or small farmers. Small and medium-sized farms produce approximately 63 per cent of the total dairy produce.

In most of the agricultural districts the small dairy farmer, instead of living on his farm, lives in the village with his neighbours, who are almost all engaged in farming like himself. Each travels to his holding in the morning with his workers, returning in the evening after his day's work. The cattle also are brought home in the evening and housed in the village. Usually the farm is a family affair. Every available piece of ground is intensively cultivated, and extreme thrift is practised throughout the whole country. Water supply and sanitation are generally defective.

These villages are relics of the feudal system, under which for reasons of defence and security, the tenants and dependants of each nobleman lived in close proximity and formed villages. Owing to the long-continued strife between the various states and provinces this system has survived in this part of the world to a much later date than in England. In the more sparsely populated regions where practically everyone is engaged in agriculture or in some industry closely allied to it there are long distances between towns and villages, and the motor car is quite beyond their means. The railway is the link which connects the isolated towns.

According to the cattle census of December 1935, Germany's total stock of cattle amounts to 18,937,861 head; of this number 10,067,345, or rather more than half, are cows, and about 6,250,000 heifers or younger animals. In the chief breeding areas about 16 per cent of the cows require to be replaced yearly; in other areas 20 to 25 per cent. The remainder of the cattle, over two and a half millions, consists of bull calves, bulls for breeding, draught oxen, and oxen kept for fattening. Of the total cattle in Germany about 55 to 60 per cent belong to the lowland breeds, and about 40 to 45 per cent to highland breeds. These breeds are distributed mainly according to the nature of the soil and the altitude, the lowland breeds predominating from North to Central Germany, and the highland breeds from Central Germany to the South.

The object in rearing lowland breeds is to increase the production of milk and beef. Highland breeds are reared for milk production, meat production, and for draught purposes. In Germany breeding directed solely towards milk production on the one hand or fattening on the other is hardly considered. The food available for cattle is not conducive to high individual milk yields. This consists mainly of pasture grass and green forage in summer, and hay, straw, root crops, and ensilage in winter. Concentrated foods of a high nutritive value are available only to a small extent. In the present economic structure of Germany there can be no question of allowing an unlimited use of concentrated food for dairy cattle, or of allowing owners to achieve high milk records with the use of concentrated foodstuffs. Whereas in 1932 Germany used approximately 2,300,000 tons of concentrates, practically all imported for her dairy cattle, the available supply last year dropped to about one million tons. As highly concentrated cattle foods are scanty in Germany, as a rule short-legged full-barrelled animals are preferred, which are easily fed and able to turn voluminous fodder to best account.

Only in Western Schleswig-Holstein are there a few districts which lend themselves to fattening by grazing, and Shorthorn cattle are kept there. In all other parts of North Germany cattle are bred for milk and meat production, and in South Germany for milk, meat, and working capacity. In South Germany and in parts also of Central Germany it is necessary to take into account the working capacity of the animal, because in these districts there are mostly very small farms on which cows are extensively used for working. On many farms horses are not kept. In North Germany the use of cows as draught animals is customary only to a limited extent.

By far the largest number of lowland cattle in Germany, about 85 per cent, belong to the black-and-white lowland breed, the Holstein Friesian. This breed is widely spread over the whole of the North German plain to Central Germany. The main breeding districts are to be found along the North Sea and the Baltic, and in the valleys of Germany—namely, in those districts which provide the best pasture lands. The Holstein Friesian is bred in Germany for milk and meat production, milk production here being considered the more important; though the meat value is also considerable owing to the large size and heavy weight of the animal. The extreme milk-yielding type is not aimed at, but rather the medium type which also ensures good meat production. The mean fat percentage in the milk of this breed in Germany ranges from 3·2 to 3·4 per cent. They show a good inherent disposition for milk production, as when well cared for and fed in proportion to milk yield they produce as large quantities of milk as the higher-yielding cows in other countries. This breed has been well developed in Germany.

Cattle keeping is of the greatest importance for the supply of the German people with milk, butter, cheese, and meat. The improvement of the breeding, feeding, and keeping conditions is a primary task laid upon German agriculture. Incisive measures have been adopted by the German Government in order to improve the breeding quality of the animals (German Cattle Breeding Law), their production (Compulsory Milk Recording Law), and their feeding (Improvement in Quantity and Quality of Home-grown Fodder). The effect of these measures will soon become manifest, and improvements will increase from year to year to the benefit of the entire economic system of Germany, and also to the advantage of the individual farmers. In compliance with the compulsory milk recording regulations, all herds, if possible, must be tested with regard to the milk yield and milk fat percentage of each cow. At the date of the Congress about 55 per cent of all cows in Germany were under test. In the course of one or two years the percentage will rise to at least 95 per cent.

Under the terms of the German cattle breeding law only selected sires may be used for breeding purposes. This regulation applies not only to bulls used on cows of other farms, but also to those used on the same farm. All bulls selected for breeding must have proof of pedigree and certificates of efficiency. Only in certain districts where the application of this law might cause hardships have transitional regulations been provided. State subsidies for the purpose of good breeding bulls have been granted, and the system is differently regulated in the various parts of the country. In South Germany and those parts of Central Germany where small farms and close villages prevail it is customary to keep a parish bull. These are at the disposal of the small farmers on payment of a stated sum. In North Germany and in other districts where the farms are larger the farmers usually keep their own bulls, or bulls on a co-operative basis.

Just as the prize system at cattle shows in Germany has been adapted to modern views in that country, so the regulations for the Efficiency Records of German Cattle have also been revised. The Efficiency Records were introduced in 1926 on the model of the official efficiency tests carried out in U.S.A. The tests lasted either 305 or 365 days. The control lasting 305 days pre-supposed a calving of the cow within fourteen months. If this condition was not fulfilled, the cow could be entered for the test of 365 days. It was only by these tests of milk yield that the efficiency of German cattle breeds became more widely known. It was found that the German cows bred for good build and dual-purpose yielded as large quantities of milk, when fed in proportion, as the American cows. The idea that progressively increased milk yields from cows tended to undermine the health and constitution of the stock was discounted by the German experts at the Congress. They held that disease was present in greater degree among poor-yielding cows; that milk capacity and disease had not necessarily any connection with each other.

But now after a sufficient number of record yields have been ascertained, and the necessary conditions upon which they were based have been recognised—namely, heavy feeding with imported highly concentrated foods, the test regulations have been altered. The new regulations have been drawn up on different lines, better adapted to the present economic condition of the country. They no longer aim at achieving record milk yields, but they tend to ascertain those cows which are distinguished by a high permanent yield when fed with home-grown fodder, as well as by good constitution and fertility. In future, only such cows will be entered in the Efficiency Records of German Cattle as have given birth to four calves by the end of their eighth year, and which in the case of lowland cattle have yielded at least 1763 lb. of milk fat and milk containing not less than an average of 3·3 per cent of fat; or in the case of highland cattle at least 1433 lb. of milk fat and milk containing not less than an average of 3·8 per cent of fat. For each additional day in the age of the cow the required minimum yield increases, in the case of lowland cattle by 15½ oz. of fat, and in the case of highland cattle by 12½ oz. of fat. If cows are over eight years old, the number of calves required is increased in correspondence with the age. Bulls are also entered in the efficiency records if at least eight of their daughters are already on the list.

Cattle keeping is of special importance to Germany. Few oleaginous plants grow, and other sources of fat exist only to a limited extent. Thus, the production of as large quantities of animal fat as possible is essential. Further, pigs and cattle must supply the principal amount of meat for the needs of the population. The great demand for milk for liquid consumption, and for cheese, must also be taken into account. As already stated only home-grown food is, as a rule, available in Germany for cattle feeding; highly concentrated food is obtainable only to a small extent. Germany is, therefore, obliged to breed cows best able to convert a voluminous fodder into milk and meat. Moreover, in these districts where small farms predominate the cows are also used for working. In the breeding of the highland types of cattle the working capacity is therefore regarded as the third utility point. Where cows are used for working it is customary to keep them in sheds during the summer also, when green fodder remains the main food; in addition, ensilage and sugar-beet is given during the earlier summer months. Winter feeding in Germany differs mainly only in the proportion of hay to straw and root crops available. In most districts turnips and cabbage are grown, and other succulent food such as ensilage, sugar-beet, and potato waste, is available to a limited extent. Great efforts are made to increase the supply of cattle food by a more extensive cultivation of catch crops; larger quantities of albumen have been obtained by growing sweet lupine and lucerne. In recent years it has been found possible to increase the milk yields by improving the quality of home-grown foodstuffs. A few years ago the average annual milk yield of all German cows was calculated at 396 gallons, while last year the average yield was estimated at 506 gallons. In appreciating the average yield it must be taken into account that about 25 per cent of the cows are used for working.

Official milk recording under a voluntary system had gradually spread in Germany, as in other dairying countries, prior to 1935. But in November of that year the German Government decided to compel all owners of cows to test and record the milk yields of all their cows. The following table shows the development of milk recording in Germany from 1925 to 1935 :—

Year.	Number of Cows Tested.	Average Annual Milk Yield per Cow.	
		Gallons	Per Cent of Fat
1925	581,691	692	3·21
1926	742,685	724	3·35
1927	819,697	777	3·27
1928	924,484	781	3·24
1929	1,015,031	798	3·30
1930	1,025,042	835	3·32
1931	1,064,050	830	3·34
1932	1,052,666	813	3·33
1933	1,041,049	820	3·33
1934	1,135,870	809	3·32
1935	1,447,793	782	3·32

In 1925 approximately 5 per cent of all German cows were officially recorded. By 1935, under the more forceful Hitler régime dating from 1933, the percentage had increased to approximately 14. During the last two years much intensive work has been done in connection with the extension of milk recording under the compulsory regulations. Milk producers were thereby compelled to give financial assistance for the purposes of official milk recording, this being for the most part collected through the creameries. Only in this manner was it possible to have by the end of 1936 as many as 36 per cent of the total stock of cows under the national milk recording scheme. Compulsory control is not yet in full operation ; in 1937 approximately 55 per cent of the total stock of cows were regularly recorded ; in due course about 95 per cent will be under the tests. At present, in most provinces small herds of two or three cows are exempted from the compulsory scheme, but the German plans cover the possibility of introducing testing of these small peasant herds as well. The scheme is subsidised by the State as well as by milk producers.

The first milk recording society in Germany commenced operations in 1897, three years later than in Denmark but six years before Scotland. The system followed prior to 1935 was in many respects similar to that in Scotland, both being based originally on the Danish model, though in Germany no special provision existed for the methodical check testing of results. Some variations in detail, however, were to be found in the different provinces in Germany. On the introduction of compulsory milk recording it was decided to make alterations in the system to adapt it better to the conditions on the smaller dairy farms and to the new method of milk marketing. The Government has united all groups of the dairy industry in one central Marketing Board for Milk, and has imposed uniform marketing regulations, delineating the districts supplying milk to each creamery. Under the new marketing rules all milk from the farms is collected at the local creamery.

There is now one system only of compulsory milk recording for all Germany, still based in the main upon the previous work of the milk recording societies. The milk of each cow is weighed by the official recorder evening and morning and tested for fat percentage at intervals of one month. Each circuit employs a part-time recorder only, in some cases a girl, who gives two to three hours daily to this work, testing on an average about 200 cows, at some 25 or 30 farms. The milk samples are taken with the milk to the local creamery, and are there tested by the District Controller of Milk Recording attached to the creamery, who may test 200 to 300 samples daily collected from 20 to 30 recorders. The work of the controllers at the creameries is in turn supervised by a Central Controller or Superior Controller for the province. Recording is simplified by the cows being housed mostly in the villages, and the milk from all the farms collected at the creamery. Usually a recorder is selected who resides in the same village. Official recorders have previously to attend a short course of instruction at an Agricultural College. In addition to weighing and sampling the milk yields they are required to advise the farmers on matters of cow feeding and management. The recorder may also weigh and record the food given to the cows. Farmers pay for milk recording at the rate of approximately 5s. 3d. per cow per year.

ANALYSES FOR MEMBERS DURING 1937.

By Dr J. F. TOCHER, Aberdeen, Analyst to the Society.

The number of samples received during 1937 was 220, of which 35 were fertilisers, 49 were feeding-stuffs, 53 were milks, 42 were waters, 30 were examinations for poisons, and 11 were miscellaneous samples. The following table (Table I.) shows the number and nature of the samples analysed during the past six years :—

Table I.

	1937.	1936.	1935.	1934.	1933.	1932.
Fertilisers	35	33	36	38	41	45
Feeding-stuffs	49	34	62	35	37	32
Waters	42	46	44	52	47	44
Other samples—						
Milks Poisons Miscellaneous	94	95	106	102	115	97
	220	208	248	227	240	218

Fertilisers.

General.—The fertilisers examined may be classified as follows :—

Table II.

Compound fertilisers	8
Poultry manure	1
Meat and bone manure	1
Bone meals	3
Steamed bones	1
Fish meal	1
Slags	2
Potash manures	3
Superphosphate	1
Waste limes	3
Ground limes	8
Limestone and ground carbonate of lime	3
	35

The average composition of the complete compound fertilisers analysed was found to be 5·85 per cent nitrogen, 6·52 per cent soluble phosphoric acid, 3·78 per cent insoluble phosphoric acid, and 7·67 per cent potash. The proportion of nitrogen in the complete compound fertilisers ranged from 3·69 to 6·71 per cent. The variation in soluble phosphoric acid was from 1·03 to 8·98 per cent, while that of insoluble phosphoric acid was from 1·74 to 6·47 per cent. The proportion of potash varied from 3·51 to 10·83 per cent. The following table (Table III.) shows the results of analyses of samples of compound fertilisers analysed during the year:—

TABLE III.

	Nitrogen	Soluble phosphoric acid	Insoluble phosphoric acid	Potash.
Compound Potato Fertiliser .	5·98	5·24	4·19	8·63
" " " .	6·30	8·98	2·84	9·12
" " " .	6·68	4·98	2·45	10·83
" " " .	6·27	6·28	3·37	9·65
Non-acid Potato Fertiliser .	3·08	..	14·00	8·73
Special Turnip Fertiliser .	5·36	4·03	6·47	5·24
Cereal Manure . . .	6·71	7·79	1·74	6·71
Mangold Manure . . .	3·69	8·35	5·39	3·51

The fertilisers analysed included, in addition to the usual compound mixtures, samples of bone meal, meat and bone manure, slag, waste lime, ground lime, shell lime, superphosphates, and potash fertilisers. A sample of slag was found to be very finely ground, 88 per cent of the powder passing through the standard sieve. Practically all the phosphoric acid present was found to be citric soluble. A sample of waste lime was found to contain 65 per cent carbonate of lime and about 7 per cent hydrate of lime. The sample was naturally rather moist. I valued the waste product at about 18s. per ton, using the unit value scale. A number of samples of ground lime was found to contain variable proportions of caustic lime, the lowest being 42 per cent and the highest 76 per cent. The guarantees usually given for ground lime vary from 65 to 90 per cent. A full analysis was requested of a sample of lime in order to determine its composition. The sample was found to contain only 42 per cent of caustic lime, 18 per cent carbonate of lime, 10 per cent magnesium oxide, 10 per cent silica, and 13 per cent of oxides of iron and aluminium. The sample was, therefore, of poor quality and contained many impurities. Two samples of ground limestone contained slightly over 80 per cent carbonate of lime. A sample of dolomite or magnesium limestone contained 54 per cent calcium carbonate and 37 per cent magnesium carbonate. A sample of cereal manure was found to be slightly above the guarantee in soluble phosphoric acid. The source of the potash in a sample of potato manure was found to be commercial sulphate of potash. A sample of poultry manure or guano contained 2·5 per cent nitrogen, 3 per cent total phosphoric acid, and 2 per cent potash.

FEEDING-STUFFS.

Forty-nine samples of feeding-stuffs were analysed during the year, including the usual compound cakes and meals, dried grass, dried grass meal, turnips, fish meal, dairy meals, and chick feeds.

The following table (Table IV.) shows the composition of the feeding-stuffs analysed :—

TABLE IV.

	Oil.	Albuminoids.	Phos. Acid			
Meat and bone meal	13·62	47·56	12·23	..	..	..
Meat and bone meal	9·85	45·86	13·39	..	..	..
Meat and bone meal	12·23	50·56	11·11	..	..	..
Meat and bone meal	14·00	45·94	12·68	..	..	..
Meat and bone meal	9·80	51·41	11·00	..	..	..
Meat and bone meal	13·36	51·75	9·62	..	..	..
Grass . . .	..	..	0·73	..	..	..
			Soluble Carbohydrates.	Fibre.	Ash.	Moist.
Compound feeding-stuff . . .	2·04	4·83	..	4·43	..	74·32
Linseed chaff . .	2·13	6·88	33·14	25·42	21·84	10·59
Locust beans . .	0·32	5·44	70·13	6·69	2·96	14·46
Fish meal . .	4·87	41·74	..	7·02	26·76	15·56
Lamb food . .	5·73	19·75	..	11·23	..	..
Lamb food . .	5·03	16·62	..	8·58	..	..
Lamb food . .	4·54	21·87	..	10·06	..	..
Dairy meal . .	4·84	25·06	..	8·60	..	..
Dairy mixture .	5·72	25·12	45·35	8·66	4·83	10·32
Pig meal . .	3·24	15·50	..	4·52	..	..
Pig meal . .	2·58	14·87	62·95	2·97	4·37	12·26
Sow meal . .	3·03	18·25	57·96	4·87	..	11·28
Baby chick mash .	8·24	17·31	..	3·75	..	..
Layers' mash . .	4·15	16·19	..	3·75	..	..
Bean pickings . .	0·91	21·13	57·38	4·60	5·02	10·96
Feeding meal . .	5·86	13·00	45·34	16·53	0·98	12·29
Feeding meal . .	1·30	9·81	54·17	16·85	5·65	12·22
Fattening cubes .	7·74	19·00	49·21	5·92	5·77	12·36
Flaked maize . .	4·18	9·56	69·98	1·63	1·48	13·17
Meal sids . .	5·64	11·00	58·43	8·45	2·33	14·15
Dried grains . .	6·60	29·00	..	13·72	..	10·50
Distillery dried grains	6·53	27·81	..	14·79	..	10·25
Distillery dried grains	7·62	20·69	43·21	14·85	2·21	11·42
Distillery dried grains	7·44	25·12	..	15·92	..	5·35
Dried grass . .	..	11·63	..	..	..	10·71
Dried grass . .	..	14·12	..	..	..	10·72
Dried grass . .	2·29	9·63	49·98	21·14	6·54	10·42
Dried grass . .	..	23·75	..	..	..	10·01
Dried grass . .	..	19·75	..	..	..	10·34
Dried grass . .	..	18·81	..	..	..	10·93
Dried grass meal .	..	12·38	..	22·31	..	..

A sample of chick mash contained an unusually high proportion of oil, 8 per cent being present. It has been found that an excess of oil or fat is detrimental to normal growth in poultry. Cod liver oil in particular has been found to be a disadvantage in a ration, not only for growth but also for egg production. Equally good results have been obtained by the use of linseed oil as against cod liver oil, but excess of any oil or fat has a depressing effect on growth and on egg production. A sample of linseed chaff, containing 2 per cent oil and 8 per cent albuminoids, was analysed. I recommended the screening of the chaff, prior to its being used as a feeding-stuff, owing to its containing a good deal of sandy matter. A sample of what purported to be fish meal was found to contain 7 per cent fibre, 12 per cent carbonate of lime, and 2 per cent sand. It, therefore, did not conform to the specification for fish meal as given in the regulations, and should have been described as 'compound meal.' The sample contained 42 per cent albuminoids, 5 per cent oil, and 3 per cent phosphoric acid. White fish meal usually contains about 64 per cent albuminoids, less than 5 per cent oil, and about 8 per cent phosphoric acid. Two samples of dried grains were found to be very good feeding value, the proportions of albuminoids being much above the average. Samples of dried grass meal and dried grass were analysed and found to contain from 180 to 300 milligrams per kilogram of carotene, the latter proportion being equal to 2 grains per pound of moisture-free grass meal. Carotene is the precursor of vitamin A. The proportion of albuminoids varied from 9 to 24 per cent. The average proportion previously reported was about 20 per cent. Experiments are being conducted at the Rowett Institute and at Craibstone with rations, with and without dried grass meal, in order to test whether there is any superiority of grass meal over other concentrates for winter feeding.

Eleven samples of turnips were analysed for total dry matter and sugar. The following table (Table V.) gives the results of analyses:—

TABLE V.

Sample No.	Total Dry Matter.	Total Sugar	Sample No.	Total Dry Matter	Total Sugar.
1	10·66	4·69	7	8·76	4·35
2	10·10	4·85	8	10·60	4·61
3	10·11	4·86	9	9·83	4·78
4	10·86	5·72	10	10·63	4·06
5	10·09	4·85	11	9·36	4·19
6	11·36	4·60			

The proportion of ash in turnips is about 8 per cent of the total dry matter. Boron is usually present in turnips to the extent of five parts per million parts of total dry matter.

Boron, if present in sufficient quantity, prevents the occurrence of brown heart disease.

MILKS.

Fifty-three samples of milk were analysed during the year. The number of samples found to be below the prescribed presumptive limits in butter-fat, or solids-not-fat, or both butter-fat and solids-not-fat, was fourteen, as against nineteen last year. Five samples were found to be low in fat, eight in solids-not-fat, and one in both fat and solids-not-fat. A sample of certified milk was found to be deficient in fat to the extent of 0·70 per cent. The proportions of fat in the samples varied from 2·35 to 7·30 per cent; while that of solids-not-fat ranged from 7·89 to 9·40 per cent. Twenty-five samples were analysed for fat and solids-not-fat, while twenty-eight were analysed for fat only. The following table (Table VI.) gives the results of analyses of the twenty-five samples which were sent in for complete analysis :—

TABLE VI.

No.	Fat, per cent.	Solids-not-fat, per cent.	No.	Fat, per cent.	Solids-not-fat, per cent.
1	3·70	8·58	14	3·10	8·44
2	3·01	8·56	15	3·65	8·12
3	3·50	8·70	16	4·60	7·89
4	3·14	8·79	17	2·61	8·50
5	3·40	8·85	18	3·57	8·78
6	3·20	8·72	19	3·65	8·55
7	4·20	8·57	20	3·15	8·50
8	3·45	8·54	21	2·87	8·29
9	2·60	8·55	22	3·30	8·22
10	3·66	8·29	23	3·65	8·48
11	3·65	8·79	24	7·30	9·40
12	3·30	8·25	25	7·20	9·15
13	3·92	8·32			

The following table (Table VII.) shows the nature of the distribution of butter-fat and solids-not-fat in these samples :—

TABLE VII.

Butter-fat percentage.	Frequency.	Percentage of the total.	Solids-not-fat percentage.	Frequency.	Percentage of the total.
under 2	..	..	under 7	..	..
2 to 3	3	12	7 to 7·5	..	..
3 to 4	18	72	7·5 to 8	1	4
4 to 5	2	8	8 to 8·5	10	40
5 to 6	..	..	8·5 to 9	12	48
6 to 7	..	..	9 to 9·5	2	8
7 to 8	2	8			
	25	100·00		25	100·00

WATERS.

Forty-two samples of water were sent in for analysis during the year. When samples of water are analysed the constituents determined are total solids, chlorides, free ammonia, albuminoid ammonia, nitrites, nitrates, poisonous metals, organic matter, phosphates, and relative alkalinity or acidity. Relatively acid waters act on metallic lead and other poisonous metals. Waters of bad quality contain relatively high proportions of free ammonia (fresh sewage), albuminoid ammonia (surface water and sewage), and poisonous metals. The following table (Table VIII.) shows the proportions of these substances together with the reaction and the proportion of nitrates in fourteen samples found to be of bad or doubtful quality :—

TABLE VIII.

No.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.	Poisonous Metals.	Reaction.
1	·0032	·0248	·24	None	Very slightly acid.
2	·0020	·0120	·40	None	Very slightly acid.
3	·0570	·0052	Neg.	None	Very slightly acid.
4	·0160	·0080	·12	None	Very slightly alkaline.
5	·0006	·0042	·02	Lead=one part per million	Slightly acid.
6	·0046	·0124	·02	None	Very slightly acid.
7	·0690	·0320	Neg.	None	Neutral.
8	·0810	·0146	·10	None	Very slightly alkaline.
9	·4360	·0480	·04	None	Very slightly alkaline.
10	·0800	·0380	·08	None	Very slightly alkaline.
11	·0144	·0112	·04	None	Neutral.
12	·0140	·0092	·04	None	Very slightly alkaline.
13	·0020	·0420	Neg.	None	Very slightly acid.
14	·0216	·6730	Neg.	None	Very slightly alkaline.

As will be seen from the above table, one sample contained dissolved lead to an extent which would render the water dangerous for drinking purposes. Two samples were found to be peaty waters, and I reported that the quality could be improved by sedimentation and filtration.

The following table (Table IX.) shows the classification of the samples of water according to quality :—

TABLE IX.

Quality.	No.
Excellent	3
Very good	4
Good	9
Fair	3
Poor	4
Doubtful	5
Bad	14
	42

POISONS.

Of the thirty samples of material sent in for examination for poisons, fourteen were stomach contents and organs of farm animals, fifteen were samples of feeding-stuffs, and one was a sample of water. Arsenic was found present in the stomach contents of a cow, and strychnine was the cause of death in three cases. It is rather surprising to find that strychnine should be the cause of death of live stock now, as it is impossible to purchase this powerful drug in any pharmacy. Its sale is prohibited by law. Strychnine cannot be sold by a chemist and druggist, but it may be dispensed in mixtures and other medicaments in the very minute quantities which medical practitioners may find to be beneficial to their patients. No mineral poisons were found in the sample of water examined. The water was, however, wholly unsuitable for live stock on account of the high proportion of sewage matter. Three samples of layers' mash were examined for poisons, with negative results. The samples contained proportions of salt varying from 0·6 to 1·9 per cent. Bean pickings were found to yield prussic acid to the extent of 0·03 per cent.

MISCELLANEOUS.

Among the miscellaneous samples was a veterinary powder for horses which contained about 55 per cent of carbonate of lime and about 29 per cent of china clay. A proprietary remedy was found to contain basic copper sulphate and sulphate of lime, while a patent medicine was found to consist of a coloured solution of ammonium carbonate containing slightly over 4 per cent of ammonia. A sample of mare's milk was found to contain 1·5 per cent fat and 10·2 per cent solids-not-fat. I find from Professor Linton's figures that (1) fat in mare's milk varies from 0·1 to 2·5 per cent, the average being 0·91; and (2) solids-not-fat varies from 8·72 to 10·39 per cent, the average being 9·41. In cow's milk fat varies from 2·1 to 7·4 per cent and solids-not-fat varies from 7·1 to 10·6 per cent. A remarkable difference in mare's milk when compared with cow's milk is the percentage and composition of the ash. There is a continuous fall in the proportion of ash in mare's milk during the lactation period—from 0·55 per cent to 0·30 per cent. I have shown that the variation in ash in cow's milk during the lactation period is from 0·56 to 0·94 per cent. The average proportion of milk sugar in mare's milk is about 7 per cent. The corresponding figure for cow's milk is 4·6 per cent.

THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1937.

THE following comparison of the cereal and other crops of 1937 with those of the previous year has been prepared by the Secretary of the Society from answers to queries sent to leading agriculturists in different parts of the country.

The queries issued by the Secretary were in the following terms:—

1. What was the quantity, per imperial acre, and quality of grain and straw, as compared with last year, of the following crops? The quantity of each crop to be stated in bushels. What quantity of seed is generally sown per acre?—(1) Wheat, (2) Barley, (3) Oats.
2. Did the harvest begin at the usual time, or did it begin before or after the usual time? and if so, how long?
3. What was the quantity, per imperial acre, and quality of the hay crop, as compared with last year, both as regards ryegrass and clover respectively? The quantity to be stated in tons and cwts.
4. Was the meadow hay crop more or less productive than last year?
5. What was the yield of the potato crop, per imperial acre, as compared with last year? The quantity to be stated in tons and cwts. Was there any disease? and if so, to what extent, and when did it commence? Were any new varieties planted, and with what result?
6. What was the weight of the turnip crop, per imperial acre, and the quality, as compared with last year? The weight of the turnip crop to be stated in tons and cwts. How did the crop braird? Was more than one sowing required? and why?
7. Were the crops injured by insects? State the kinds of insects. Was the damage greater or less than usual?
8. Were the crops injured by weeds? State the kinds of weeds. Was the damage greater or less than usual?
9. Were the pastures during the season of average growth and quality with last year?
10. How did stock thrive on them?
11. Have cattle and sheep been free from disease?
12. What was the quality of the clip of wool, and was it over or under the average?

From the answers received, the following notes and statistics have been compiled :—

EDINBURGH DISTRICT.

MID-LOTHIAN. *Wheat*—50 bushels per acre; quality of grain very good; straw, 40 cwt. per acre; seed sown, 3½ bushels per acre. *Barley*—48 bushels per acre; quality of grain good; straw, 20 cwt. per acre; seed sown, 3 bushels per acre. *Oats*—60 bushels per acre; quality of grain good; straw, 25 cwt. per acre; seed sown, 4½ bushels per acre. *Harvest*—Began about the usual time. *Hay*—2 tons 5 cwt. per acre; early mown hay considerably damaged by wet weather, and much of it of inferior quality; later mown was specially well secured and of splendid quality. *Meadow Hay*—Very little grown, but where grown a higher yield per acre than last year. *Potatoes*—5 tons per acre; rather more disease than the previous year. *Turnips*—15 tons per acre; much better quality than the previous year. *Insects*—Very little damage from insects. *Weeds*—Not injured to any extent. *Pastures*—Very good. *Live Stock*—Throve very well. Cattle and sheep were free from disease. *Clip of Wool*—Average clip, of good quality.

EAST LOTHIAN (Upper). *Wheat*—Yield of grain much better than last year; rather above the average; 48 to 56 bushels per acre; grain and straw good quality; seed sown, 3½ to 4 bushels per acre. *Barley*—About average crop; 48 to 54 bushels per acre; quality of grain very good; straw, fair average; seed sown, 3 to 3½ bushels per acre. *Oats*—A good crop of both grain and straw; 60 to 68 bushels per acre; grain in most cases badly discoloured owing to four days' rain and fog in last week of August; straw fair quality; seed sown, 4 to 5 bushels per acre. *Harvest*—Started about same time as last year, and with the exception above mentioned, crops were got in in good time and condition; hill districts got a very good and quick harvest. *Hay*—Above an average crop; 55 cwt. per acre, but very much damaged in handling owing to wet and foggy weather. *Meadow Hay*—Very little grown, but, being later, was got in in very good condition. *Potatoes*—A good average crop; 8 to 10 tons per acre with the exception of King Edwards and some Great Scots, in which disease started early in August; where early and repeatedly sprayed, all crops were good; very little leaf-curl and virus disease; no sprain. *Turnips*—Very variable crop; a great deal of finger-and-toe and dry-rot owing probably to the heavy wetting of the land by rain and snow in March; about 14 to 16 tons per acre. *Insects*—Very little damage by insects; less than previous years. *Weeds*—Annual weeds very troublesome in turnip crop; difficult to get cleaned owing to wet weather and shortage of casual labour. *Pastures*—Rather above average growth all season, and good quality. *Live Stock*—Both cattle and sheep grazed well. Cattle and sheep were free from disease, but a big death-rate in ewes and lambs at lambing-time owing to the March snowstorm. *Clip of Wool*—Average clip.

EAST LOTHIAN (Lower). *Wheat*—The yield was greater than last year by about 6 to 8 bushels; the average yield probably about

44 bushels per acre; straw considerably more than last year; about 38 cwt. per acre; the weather was bad in the earlier part of harvest, but improved, and the crop was secured in fairly good condition; seed sown, 3 to 4 bushels per acre. *Barley*—The best cereal crop of the season; wet weather in August did considerable damage to quality, but the crop was secured in good condition, and it met a good market; the yield was above average in both grain and straw; on the best barley land as much as 64 to 72 bushels of malting barley were obtained, and yields of 48 to 60 bushels per acre were common; straw yield normal; seed sown, 3 to 3½ bushels per acre. *Oats*—Under average, and quality disappointing; although the crop was mostly secured in good condition, bad weather in August retarded harvesting and discoloured both grain and straw; yields similar to last year. *Harvest*—Crops were ripe early in August, but owing to wet weather very little was reaped until the last week in that month when many fields were overripe; the weather then cleared up for a few weeks, and although many fields were badly twisted and laid, the work proceeded expeditiously, thanks to the extensive use of tractors and tractor-binders. *Hay*—The hay crop was heavy owing to excess of moisture and good growing weather; yields up to 3 tons per acre were not uncommon, but unfortunately a spell of broken weather overtook haymaking and a considerable proportion of the crop underwent some deterioration in being secured. *Meadow Hay*—None grown. *Potatoes*—Were a very variable crop; on hard land they suffered from the soaking the land got in spring; earlies, however, on suitable land were a very good crop and were harvested up to time although planted very late; lates on easy land also gave promise of a good crop and yielded well where not badly affected by disease; but by the end of July potato disease became very prevalent; a great deal of spraying was done to counteract its ravages; nevertheless, there was a good deal of disease at lifting time, and, while some fields were good, the crop on the whole was barely an average one. *Turnips*—Were a light and variable crop; they suffered a good deal from finger-and-toe, owing to the wet spring; the turnip-midge continues to ravage this crop so much that in some districts it is scarcely worth trying to grow it, and mangels are being extensively substituted; on the whole the crop was well below an average. *Insects*—The most serious insect pest in this district at the present time is the turnip-midge, for which no remedy appears to have been found. The wet weather in July and August helped to minimise the damage, but nevertheless it seriously handicapped turnip growing on some of the best land in the county. No other insect pest did serious damage. *Weeds*—Crops were, owing to wet weather and scarcity of labour, badly affected chiefly by annual weeds; owing to these difficulties the expense and damage was considerably greater than usual. *Pastures*—Were very good; it was a good grazing season. *Live Stock*—Throve well. Cattle and sheep were free from disease. *Clip of Wool*—About an average clip, and the price was exceptionally good for those who sold immediately. *Sugar Beet*—Continues to be grown successfully in this district, and would be more in favour but for the scarcity and high cost of casual labour. It did well on the whole, although not quite so well as last year, probably due to adverse weather and lack of labour at singling and hoeing time.

BORDER DISTRICT.

BERWICKSHIRE (Merse). *Wheat*—By 1st January early sown winter wheats were looking exceptionally well, but as the early winter had been broken and catchy a considerable acreage was not sown until December. Despite bad seeding conditions the total area of over 8000 acres showed a further increase of some 450 acres and was the highest acreage for many years. With a late cold wet spring, wheats did not make much progress. Some fields were substantially thinned out, while a few had to be ploughed out. Ears showed up towards the end of June, and harvest commenced by the end of August, though some spring wheats were very late indeed before they could be cut, and consequently were poor samples. Otherwise harvest generally was quite good, the crop generally standing, and strong high winds made it fit to carry in a short time. Yields were below normal at 32 bushels per acre, with a natural weight of 61 lb. Straw good quality, but lacked bulk; about 26 cwt. per acre. *Barley*—Also showed an increase of over 500 acres, raising the total to 8336 acres. With a bad spring and work behind, the crop was late in being sown. The land never was in condition, and every operation was done under adverse conditions. 2½ to 3 bushels per acre was the usual seeding. Brairds came irregularly, except on the lighter lands, and lacked vigour and colour. Ears were late in appearing, while the crop matured too rapidly thereafter. Much of it was down by cutting time, the straw appearing to have no body, which entailed cutting as best one could, with large patches to do by hand. In consequence the sample was none too good, coloured, and not well filled; an under-average yield of 30 to 36 bushels per acre and natural weight 53½ lb., with 24 cwt. of poor quality straw. *Oats*—With the lingerings of the March snowstorm it was April before much of the oat crop was seeded. Even then the land was not in condition. The total acreage sown, 20,323 acres, showed a further slight fall from the previous lowest. A customary seeding was 5 bushels per acre, or 4 for potato varieties. The braird showed up in three weeks' time, fairly regular and robust, and the ears made their appearance by the first week in July. Generally the crop was reasonably good to cut and bulked fairly well, but threshing records were disappointing. Very wide differences in yields were experienced, with a natural weight round 42 lb. Straw was useful fodder, if somewhat scarce, at 26 cwt. per acre. *Harvest*—Despite a late seed-time oats and barley matured and ripened rapidly, and harvest was general by the last week in August—not an unusual time for the Merse. Conditions were reasonably good, though high winds accounted for a considerable shake in all cereals. On the other hand stooks were soon in condition to carry, so the crop was secured in good order and in reasonable time, except in the case of spring wheats, some of which were very late before they could be cut. *Hay*—The acreage was again increased and the crop quite an average and well mixed with clover. Conditions generally were quite good, but with work so upset by the lateness of spring work, the hay crop unfortunately had to be taken when it was possible to leave other pressing calls. In consequence much was overripe and badly laid and twisted, making cutting difficult and wasteful. Apart from that the crop was mostly secured in fair condition with little further waste, though in numerous instances ricks stood out until harvest work had begun. The crop averaged fully 30 cwt. per acre, but with, in many cases, late cutting the aftermaths were disappointing. *Meadow Hay*—Similar conditions apply to the permanent grass hay which bulked out quite well at 24 cwt. per acre. The acreage showed the large increase of 1000 acres. *Potatoes*—It was into May before much planting could be done; still, the acreage showed a slight increase on the previous total. We were by then having better conditions and the plants were soon showing above ground; growth was fairly rapid and a good haulm was thrown up, eventually to go down during the latter half of August with disease. The crop, though under average in size and weight, was harvested in good condition and kept fairly well in pit. Little spraying was done and new varieties were not tried out on any scale. *Turnips*—Except on the lighter lands, it was well on in the season before much could be done in the way of turnip sowing, as the land was not in condition to work all April; the work was so retarded that in many cases turnips were not attempted and late rape was sown instead or in some instances bare fallowed. Brairds came away quite quickly and little resowing was done. Plants came quickly to the hoe except where ravaged by the fly, which was very severe and persistent. On that account singling was irregular and clashed with other pressing work. The plants at an early stage showed unmistakable signs of a widespread attack of finger-and-toe, though swedes were not so badly affected as yellows: Annual weeds were most troublesome, and could not be held in check; the necessary time for hand hoeing could not be found and labour was scarce. Few swede crops were up to an average and many fields of yellows very poor, varying from 30 tons in the case of swedes to half of that and practically a blank in others. The total acreage showed a reduction of 1000 acres, most of which would be taken up with the increasingly popular Marrow-stem Kale. *Insects*—No damage other than by the turnip-fly; the damage probably was no greater, but owing to the lateness and urgency of retaining available plants the attacks appeared more menacing. *Weeds*—No injury other than by annuals in the root crop; the prevailing weather made it impossible to clean land from couch-grass. By autumn root fields were undoubtedly weedier than usual. Thistles in pasture are a most serious problem and it was not possible to spare time to go over all the fields last summer. *Pastures*—Grass came away early and pastures were excellent to the end of May, when a strong growth set in, lasting fully two weeks, when the grass got out of hand. The hot weather in mid-June checked growth and little or no recovery was made until the beginning of autumn. Aftermaths were poor and seeds weak at harvest-time. *Live Stock*—The season proved as difficult for the stock-owner as for the arable farmer. A very severe snowstorm, lasting from the end of February through the most of March, did infinite harm in the lambing fields. In the low country no direct loss was attributable to drifting snow, but the indirect loss, both in ewes and lambs, was very heavy, while the earlier lambs suffered seriously from cold and wet, both before and after the storm. Sheep stocks took a long time to recover from the check, though by sale time lambs were well up to average. Prices were good at the opening sales, but fell away badly. Even though, with the drop in the price of fat sheep, feeders of all classes have had nothing but loss on their overturn. Cattle grazed fairly well and sold well in the earlier part of the season, but later the drop in price left little margin. Breeding stocks did well, and there was a very good market for suckled calves at the October sales. Cattle and sheep were generally free from disease other than the usual lambing troubles, which were exaggerated on account of the bad weather. *Clip of Wool*—Neither of average weight nor quality. *Sugar Beet*—Rather more was grown, but the season was unsuitable, resulting in a lessened tonnage and lower sugar percentage.

BERWICKSHIRE (Lammermoor). *Wheat*—The acreage grown appears to be increasing year by year; the quality and quantity of both grain and straw was better than last year. *Barley*—Not a large area sown in this district; about an average for yield and quality. *Oats*—A full average yield; good quality grain and straw; some fields badly laid, in which case grain light and poor and straw of little good; about 48 bushels per acre; seed sown, 4 to 6 bushels per acre. *Harvest*—Began about the usual time, although a week later than last year. *Hay*—On the average a much better crop than last year, and mostly harvested in good condition; the yield would be about 2 tons per acre. *Meadow Hay*—More productive than last year. *Potatoes*—An average yield of potatoes; about the same as last year; disease did not do much damage. *Turnips*—A rather variable crop; some very good fields, especially on the lighter soils; on heavy land many bad fields; finger-and-toe did most of the damage; second sowing not nearly so necessary as last year; yield, say, 18 tons per acre. *Insects*—Turnip-fly still troublesome but not so bad as last year. *Weeds*—In rotation crops appeared to be well kept in check; thistles on pastures still extremely bad. *Pastures*—Were better in the spring than last year, and fairly good during the season. *Live Stock*—On the whole, stock throve well. Cattle and sheep were fairly free from disease. *Clip of Wool*—Average clip of good quality wool.

ROXBURGHSHIRE. *Wheat*—Similar acreage to last year; yield slightly less; spring-sown wheat in many cases was very late in ripening, but yielded quite well. *Barley*—A slight increase in acreage; 36 to 40 bushels per acre; on high land an average yield, but on the better land the yield and quality were poorer than last year. *Oats*—Grain and straw not so heavy as last year; on high-lying land an average yield; on the better land, yield 20 per cent below last year. *Harvest*—Began middle of August and was prolonged, in some cases due to labour shortage and in others to late ripening of spring-sown wheat. *Hay*—Early harvested hay was a good crop and well got; later crop not so good. *Meadow Hay*—A heavy crop and mostly good quality. *Potatoes*—Not so good a crop as last year, the shaws in many cases going down too soon; 6 to 10 tons per acre; less disease than last year. *Turnips*—An average crop; crop brairded well and little resowing required; failures generally due to finger-and-toe. Pigeons were very hard on swedes in some districts. *Insects*—Not much damage by insects. *Weeds*—Crops not seriously injured by weeds. *Pastures*—Grass came early and pastures were good; in early summer grass was difficult to keep down. *Live Stock*—Throve quite well. Cattle free from disease, apart from a certain loss from abortion and loss among outlying cows from grass tetany. There was more than average loss in lambing ewes and lambs, due to bad weather during lambing. *Clip of Wool*—An average clip, of good quality.

SELKIRKSHIRE. *Wheat*—None grown. *Barley*—Not much grown. *Oats*—The heavy snowstorm in March delayed ploughing operations, and seed-time was a fortnight later than usual; when the good weather came, oats brairded quickly and finished an average crop; from 30 to 40 bushels per acre, of good quality. *Harvest*—Began about the first week in September, and where crops were lodged and with unsettled weather was more protracted than usual, but very little damage was done to the grain. Harvest lasted from four to six weeks. *Hay*—A heavy crop, secured in excellent order. *Meadow Hay*—A heavy crop, secured in excellent order. *Potatoes*—An average crop, 5 to 7 tons per acre, with some disease. *Turnips*—The turnip crop was considerably below the average; on account of wet weather in May, turnips were sown when the land was in very indifferent condition, but brairded well and no resowing; finger-and-toe disease prevalent; 15 to 20 tons per acre. *Insects*—Greater damage than usual. *Weeds*—Not much injury by weeds where sufficient labour could be procured to keep weeds in check, but casual labour difficult to get. *Pastures*—The season was very favourable for grass. *Live Stock*—Throve well. Cattle and sheep were free from disease. *Clip of Wool*—Average clip.

PEEBLESSHIRE. *Wheat*—Not much grown. *Barley*—A little more grown than previous year, but still a small acreage; from 36 to 42 bushels per acre; straw more bulk than usual. *Oats*—A very heavy crop and difficult to cut; new varieties on good land from 48 to 64 bushels per acre; thin-skinned common oats from 36 to 42 bushels per acre; in the later and poorer districts from 28 to 36 bushels per acre; straw more plentiful than usual. *Harvest*—Began a few days earlier than previous year; on the whole, fairly good, although the early districts had a bad week when grain was ready to lead in; the late districts had an excellent harvest. *Hay*—Ryegrass was one of the heaviest crops for many years; in many cases over 3 tons per acre; notwithstanding a wet spell at the beginning of the hay harvest, it was secured in excellent condition. *Meadow Hay*—Crop much about the same as usual; quality good. *Potatoes*—Barely an average crop; more disease than usual; about 6 tons per acre and lifted in nice condition; Kerr's Pink again the popular variety, although where grown too long on same farm potatoes smaller. *Turnips*—An excellent crop; very well grown and free from disease; one of the best turnip years for a long time; swedes in many cases over 50 tons per acre; brairded very quickly. *Insects*—No damage. *Weeds*—Nothing unusual. *Pastures*—Decidedly above average growth. *Live Stock*—Throve well. Cattle and sheep were free from disease. *Clip of Wool*—Quality excellent, and clip above the average.

DUMFRIES DISTRICT.

DUMFRIES (Annandale). *Wheat*—The acreage decreased, and the yield was under average; grain, 40 bushels per acre; straw, 30 cwt. per acre. *Barley*—None grown. *Oats*—The acreage about the same as last year; grain, 45 bushels per acre; straw, 30 cwt. per acre; seed sown, 5 bushels per acre Potato oats; 6 bushels per acre of the thick-skinned varieties. *Harvest*—Began about the 15th August. Oats were badly laid and a larger acreage than usual had to be cut one way, but weather was favourable and cutting generally completed in fourteen days. The stacking of the grain was prolonged owing to bad weather. *Hay*—About an average crop. Cutting started last week in June. Owing to bad weather in the first fortnight the first cutting was very badly spoiled; after that the weather improved and the rest was secured in good condition. Yield about 2 tons per acre. *Meadow Hay*—Crop was got in good order and was much heavier than last year. *Potatoes*—A good crop was secured in good condition and free from disease; yield about 8 tons per acre; no new varieties planted. *Turnips*—Yield above average and very free from disease. The crop brairded well and required practically no resowing; weight, 26 tons per acre. *Insects*—Practically no trouble from insects. *Weeds*—Very little injury from weeds; much less than usual owing to better growing conditions. *Pastures*—Above average owing to regular rainfall. *Live Stock*—Both sheep and cattle did well and rather above average. Cattle and sheep were free from disease. *Clip of Wool*—Up to average.

DUMFRIES (Nithsdale). *Wheat*—None grown. *Barley*—None grown. *Oats*—Grain well filled; threshed better than previous year. *Harvest*—Earlier than last year; general by beginning of September; not so badly laid as last year. *Hay*—Fair average crop; ryegrass not well got; the rest very well got. *Meadow Hay*—A good crop and well got. *Potatoes*—About 5½ tons to 6 tons per acre; quality good; fairly free from disease. *Turnips*—About 20 tons per acre; brairded well and quickly; a little disease. *Insects*—No injury. *Weeds*—Not so many weeds as last year. *Pastures*—Were even better than last year, and lasted longer into October. *Live Stock*—Throve very well. Cattle and sheep were fairly free from disease, but udder-clap more prevalent in dairy stock. *Clip of Wool*—Good quality but still much lighter than the average clip.

DUMFRIES (Eskdale). *Wheat*—None grown. *Barley*—None grown. *Oats*—Lea oats were mostly very good crops, but many sown-out oat crops were very small and short-strawed; 33 to 38 bushels per acre; quality fairly good; about 5 bushels per acre sown of Potato oats, and about 6 bushels per acre of the heavier oats. *Harvest*—Commenced about the same time as last year, but was much quicker over on account of better weather. *Hay*—Crop all over was good, especially ryegrass; mostly secured in very good condition; ryegrass hay would be about 32 to 36 cwt. per acre. *Meadow Hay*—Not so heavy as last year, but mostly got in good condition. *Potatoes*—Crop much better than last year and free from disease; were mostly lifted in very good condition as the weather for lifting was exceptionally good; no new varieties planted. *Turnips*—Very much better than last year all over; some very good heavy crops and very sound; mostly brairded well and not many resowings required, although some were bad with fly and required to be sown two or three times. *Insects*—Very free from insects; less damage than usual. *Weeds*—Not many fields bad with weeds, excepting where turnips did not come away well and weeds got up; mostly charlock and couch-grass; less than usual. *Pastures*—Were fully an average growth and quality better than last year. *Live Stock*—Did very well. Cattle very free from disease; sheep also very free; inoculation for braxy and also for louping-ill have reduced the deaths from those diseases. *Clip of Wool*—Was of good quality but did not weigh so well as last year.

KIRKCUDBRIGHTSHIRE. *Wheat*—The acreage of wheat was about the same, though this is small; the yield of straw and grain 30 per cent better than last year, owing to ideal harvesting conditions. *Barley*—Very little grown. *Oats*—The season favoured this crop and splendid bulk of first-class grain and straw was secured; the Potato varieties predominated and crops of 30 to 35 cwt. straw, and 60 bushels per acre were common. *Harvest*—Began generally by the middle of August, earlier than usual, and ideal weather conditions enabled the crop to be cut and secured expeditiously in spite of the heaviest crops being laid. By the third week in September a profitable harvest had been completed, ten days earlier than usual; a sign of the changing methods was the big acreage cut by contractors with tractors and power binders, who had a record season favoured by standing crops. *Hay*—Ryegrass hay was a bulky crop and would average 2 tons per acre, but the weather was bad in the beginning of July and it was wasted before it was ricked. *Meadow and Lea Hay*—Was a big crop, over 2 tons and up to 3 tons per acre, and mostly cut later in July and secured in fine order; it was better than any hay got the year before. *Potatoes*—Early potatoes had favourable weather and came to maturity quickly; no checks with frost, and were lifted early in July; the main crop was better than last year and would realise 8 to 9 tons per acre, with no disease. *Turnips*—Crop brairded well and came to the hoe quickly, so much so that there was difficulty in keeping up with the plants; showery weather impeded the work; weeds did not die in the rows and fields were very dirty. The turnips grew on, however, and were a good crop, averaging 22 tons per acre, except on heavy land where they soured. *Insects*—No insect troubles were encountered and crops were healthy. *Weeds*—Were of the annual type, redshank, charlock, &c., and in some cases reduced the yield considerably. *Pastures*—Grass came very early in April and stock were out before 1st May and had plenty to eat to the end of November. The year was above the average. *Live Stock*—Throve well all summer and had an exceptional autumn, the rainfall being much below the average and frosts were absent. Cattle and sheep were free from disease. *Clip of Wool*—The wool clip would be above average on low ground sheep and average on the hills.

WIGTOWNSHIRE. *Wheat*—Very little grown. *Barley*—Very little grown. *Oats*—Lea oats 36 to 38 bushels per acre; oats after green crop 46 to 48 bushels per acre; seed sown—Potato oats, 5 to 6 bushels per acre broadcast, 3 to 5 bushels per acre drilled; large varieties, 6 to 8 bushels per acre. Good weather was generally experienced at seed-time with a good dry seed-bed. The braird was good, but was checked by cold weather later; on late land some damage by grub was done; crops stood up well, especially the heavy varieties, and a good deal of cutting was done by binders. *Harvest*—Began about the same time as last year and good weather was experienced nearly all the time; compared with the previous year, cutting was an easy task; oats generally were stacked in good condition as the weather was favourable. The harvest was generally considered to be the best for some years. *Hay*—About 2 tons per acre; a bigger quantity than previous year; the quality was up and down, some very good and some very poor owing to the long spell of wet weather in the end of June and beginning of July. *Meadow Hay*—Better than last year; about 2 tons per acre; the quality was good. *Potatoes*—Early potatoes were badly frosted and their progress retarded; a light crop was dug at the start, with improvement later; 8 to 10 tons per acre; Epicures mostly were planted; late potatoes were an average crop and were lifted earlier than the previous year; 8 tons per acre. *Turnips*—12 to 16 tons per acre; as a rule brairded well and the weather generally at thinning-time was very good; later, in the end of June and early July a good deal of wet weather was experienced, and although the crops looked well for a time, disease began to appear in many places, as also the whiteworm, and the early promise of a big crop was not fulfilled. *Insects*—No injury to any great extent. *Weeds*—Dockens seem to be on the increase, but redshank, except in odd cases, was not so prevalent as last year; on most places other weeds were kept under control fairly well. *Pastures*—Were bare at first and came away slowly owing to cold in the late spring and early summer; later they improved, but over all were only average. *Live Stock*—Dairy cows had not such a good yield as the previous year, for the reasons given above. As in previous years, grass-sickness, navel-ill, and hoose took their toll of life; but the year was not any worse for disease among cattle and sheep than the previous year. *Clip of Wool*—Average in quantity and quality.

GLASGOW DISTRICT.

AYRSHIRE. *Wheat*—Grain, 48 bushels (63 lb. per bushel) per acre; straw, 22 cwt. per acre. Both grain and straw were of much better quality than last year. Seed sown, 2 to 3 bushels per acre. *Barley*—Practically none grown. *Oats*—44 bushels per acre (40 lb. per bushel) of good quality; straw, 20 cwt. per acre; seed sown, 5 to 6 bushels per acre. *Harvest*—Began about normal time, a few days later than last year, and was very speedily carried through. The grain was secured in good condition. *Hay*—A good crop, about 30 cwt. per acre, but some of the early green-cut hay was badly damaged by broken weather. *Meadow Hay*—A good crop and secured in good condition. *Potatoes*—Yield was not so heavy as last year; about 6 tons per acre. Blight disease was more prevalent than last year and a number of fields were sprayed with sulphuric acid to secure the tubers for seed. Doon Early again gave promising results as a new first early. *Turnips*—The weight of crop was not so heavy as last year—about 15 tons per acre—but the roots were of better quality and much freer from disease. The crop was slow in brairding but made good progress in the later part of the season. One sowing was sufficient. *Insects*—The effects of eelworm were still apparent on potatoes, but not so bad as last year. *Weeds*—Root crops, especially turnips, suffered considerably from prevalence of weeds. Due to wet weather and shortage of labour, weeding was not expeditiously carried on at the right time. *Pastures*—Had a normal growth of good quality which continued about a month longer than usual in the autumn. *Live Stock*—Did well and artificial feeding was not required till much later than usual. Stock generally have been healthy. *Clip of Wool*—Was about average.

BUTE. *Wheat*—None grown. *Barley*—None grown. *Oats*—A good crop, very bulky in most places; threshed better than last year. *Harvest*—Started about the usual time, but with broken weather during cutting time, lasted longer than usual. Some crops were badly laid before the end of cutting, but no complaints about sprouting. A spell of good weather at the end of cutting and during the leading-in made it finish a good harvest. *Hay*—Crop in general was poor; about 1½ tons per acre. One or two early lots, however, turned out very good. *Meadow Hay*—Not much grown here; a fairly good crop and well got. *Potatoes*—The early crop Epicures were again good this year, in many cases 7 tons per acre. Digging started on 9th June, a little earlier than last year. The principal late potato, Kerr's Pink, was not so regular a crop. No new variety grown; very little disease. *Turnips*—Crop would be about 20 tons per acre. Brairded well, and no resowing required. A lot of disease in swedes, which made them unfit for shop purposes. More than usual rotted after the frost. *Insects*—No damage caused. *Weeds*—Not much damage from weeds. Redshank came up in a number of cases. *Pastures*—Bare at first, but got better in the back-end. *Live Stock*—Throve well. Cattle and sheep were free from disease. *Clip of Wool*—Average bulk and good quality.

ARRAN. *Wheat*—None grown. *Barley*—None grown. *Oats*—A good crop generally; yield, 25 to 30 bushels per acre; seed sown, about 5 bushels per acre. *Harvest*—A week earlier than usual, and secured in good condition. *Hay*—The crop on the lower farms was good, with a yield of 2 tons per acre, but on the higher farms was of middling quality. *Meadow Hay*—Not a great deal grown. *Potatoes*—6 to 7 tons per acre; a good healthy crop. New Arran varieties, such as Pilot, Peak, Signet, were in fair demand. *Turnips*—Crop was varied, and on many farms was affected by black heart, known as raan; marrow-stemmed Kale grown instead on many farms. *Insects*—No damage reported, but wood-pigeons severely injured the braird. *Weeds*—No injury to any great extent where properly handled. *Pastures*—good; marked results from use of lime and slag. *Live Stock*—Did well, and there was a good demand for calving heifers. No disease has been reported, but the 'tick' caused much loss in sheep. *Clip of Wool*—Much the same as in previous years, but prices were very low and very little was sold.

LANARKSHIRE (Upper Ward). *Wheat*—Only small quantities grown. *Barley*—None grown. *Oats*—55 to 65 bushels per acre. *Harvest*—Commenced 10th September; weather good; crop secured in excellent order. Straw and oats of very good quality. *Hay*—35 to 45 cwt. per acre; a good crop; secured in grand order. *Meadow Hay*—Average crop, secured in good condition; much the same as last year. *Potatoes*—6 to 9 tons per acre; a larger crop than last year; no disease; no new varieties planted. *Turnips*—25 to 35 tons per acre; an extra good crop; brairded well; no resowing. *Insects*—No damage done. *Weeds*—Less troublesome than usual and easily kept in check. Charlock appeared to be on the increase. *Pastures*—Full average growth; quality good. *Live Stock*—Throve well. Cattle and sheep free from disease. *Clip of Wool*—Good.

LANARKSHIRE (Middle and Lower Wards). *Wheat*—25 to 28 cwt. per acre according to class of soil; straw, 30 cwt. per acre; quality of grain and straw superior to past season; seed, mostly English, 3 bushels per acre; Scots seed, 4 bushels per acre. *Barley*—None grown. *Oats*—27 to 30 cwt. per acre; straw, 25 to 30 cwt. per acre; quality of grain and straw superior to last season; seed, 6 to 6½ bushels per acre for new varieties and 5 to 5½ bushels per acre for others. *Harvest*—Commenced from second to third week in August, about one week earlier than last year. *Hay*—First-cut ryegrass, 40 to 45 cwt. per acre; quality good, the early cut having been well got. *Meadow Hay*—45 to 50 cwt. per acre, generally got in good condition. *Potatoes*—8 to 9 tons per acre; weight of crop similar to last year; potatoes smaller in size and some disease appeared previous to lifting. *Turnips*—Generally a good crop, 25 to 30 tons per acre; crop grew well from date of sowing. *Insects*—The only crops seriously affected by insect pests were carrots, cabbages, and cauliflowers. In certain cases the carrot crop was badly affected by carrot-fly, and what remained of the crop had to be ploughed up. *Weeds*—Generally speaking, all farm and market garden crops were comparatively free from weeds as compared with 1936. *Pastures*—The grazing season was a good one and extended well into the back-end. *Live Stock*—From the returns available the milk yield, except for two months, June and July, appeared to have been less than in 1936, not due to lack of pasture, but to many farmers changing over to Grade A. (T.T.) stock. Feeding cattle and sheep did well on the pasture. Cattle and sheep were free from disease, but the season was again worse for maggot-fly. *Clip of Wool*—Generally speaking, was up to the average.

RENFREWSHIRE. *Wheat*—An average yield of both grain and straw; grain on heavier soils from 30 to 32 cwt. per acre; on less suitable soils from 20 to 30 cwt. per acre; straw from 25 to 30 cwt. per acre; seed sown, 3 to 4 bushels per acre. *Barley*—None grown. *Oats*—An average to good crop; 25 cwt. grain and 25 cwt. straw per acre; seed sown, 5 to 6 bushels per acre. *Harvest*—Commenced about middle of August, about a week earlier than previous year, and finished about the third week in September; weather again difficult with much morning dew, and in consequence a proportion of the crop was led too soon, resulting in heated stacks. *Hay*—A good crop with an abundance of clover; commenced cutting about third week in June; weather for the first three weeks very broken and crop badly damaged, but by the 15th July weather improved and the last week of the month was notable for ideal haymaking weather with bright sunshine tempered by drying winds; crop all secured by end of July; yield—ryegrass, 35 to 45 cwt. per acre; timothy, about 55 cwt. per acre, but not much now grown. *Meadow Hay*—Little grown, but quantity and quality better than last year. *Potatoes*—Yield rather better than last year; second earlies and main crops (Kerr's Pink and Redskin) 9 to 12 tons per acre; Golden Wonder, 7 to 10 tons per acre; not much blight, but Kerr's Pink on some farms inclined to grow too much shaw. No new varieties of note except Redskin, which is now past the experimental stage. *Turnips*—A good braird, came quickly to the singling stage and finished a good crop; yield, 25 to 35 tons per acre; no resowing reported. *Insects*—No marked injury to crops by insects. *Weeds*—Annual weeds no worse than usual, but less hand-hoeing was done on account of the continued shortage of labour. *Pastures*—Grazed well both early and late in the season and foggage an especially good crop. *Live Stock*—Throve well. Cattle and sheep free from disease except that udder-clap increased in dairy cows and heifers; even some suckling cows attacked by it; maggot-flies not so prevalent as in former years. *Clip of Wool*—Average clip.

ARGYLLSHIRE (Lochgilphead). *Wheat*—Practically none grown. *Barley*—None grown. *Oats*—A good crop and generally well secured; grain, 30 to 35 bushels per acre; straw, 1 ton per acre; seed, 5 to 6 bushels per acre. *Harvest*—Began about a week later than usual. *Hay*—Rather better than last year both in quantity and quality; 25 to 30 cwt. per acre. *Meadow Hay*—Considerably more. *Potatoes*—Average crop; 7 to 8 tons per acre; some complaints of potatoes not keeping in the pits; no new varieties planted. *Turnips*—Very fair crop, about 25 tons per acre; brairded well and not much resowing. *Insects*—Crops not injured to any extent. *Weeds*—Crops not damaged to any great extent. *Pastures*—Average growth and quality, and held out well in the back-end. *Live Stock*—Throve very well, but trembling in cattle probably on the increase. *Clip of Wool*—Average.

ARGYLLSHIRE (Kintyre). *Wheat*—None grown. *Barley*—Comparatively little of this cereal now grown; yield about average or a little over; quality better than in preceding year; seed sown about 4 bushels per acre. *Oats*—Crop better in quality and quantity of grain than in preceding year; colour of grain decidedly superior; average yield of grain about 17 cwt. per acre, with a district range of 15 to 23 cwt; straw much the same in bulk but of better quality, 25 cwt. per acre; seed sown, about 5 bushels per acre broadcast. *Harvest*—Commenced about usual time, but finished a week or two earlier. *Hay*—Fully better than in preceding year; early crops got in excellent condition; later crops suffered rather from weathering; yields varying from 25 to 55 cwt. per acre; average about 33 cwt.; red clover unusually abundant in some crops. *Meadow Hay*—Rather above average on the whole; in many instances experienced too much weathering; average yield about 30 cwt. *Potatoes*—Some excellent crops, but on the average about 10 cwt. per acre under the yield of crop of 1936; average yield about 6½ to 7 tons per acre; blight appeared early on the shaws in a few cases, but generally a healthy crop; kept well in the pits; no new varieties grown to any extent; Epicures and Kerr's Pink most widely grown; crops lifted under excellent weather conditions. *Turnips*—Conflicting reports made it difficult to strike an average yield, some crops amounting to over 30 tons per acre while others were less than half that figure; average about 19 tons per acre; crops generally brairded quite well and very few second sowings were required; finger-and-toe disease accounted for several failures of crop; raan disease present in some crops, but not very severe. *Insects*—Some damage to turnip and marrow-kale crops by turnip-fly, but little serious injury done; root-maggot and mud beetle responsible for damage in several instances to turnips and swedes; wireworms reported hurtful to several potato crops. *Weeds*—Most prevalent weeds were spurry, chickweed, and redshank in root crops on the wetter soils; charlock not so plentiful in corn crops. *Pastures*—Late in starting and less vigorous blooms of wild white clover in midsummer; autumn keep very flush and growth prolonged into the season, with no back-end storms to cut down the grass; some very good red clover aftermaths a feature of the season. *Live Stock*—Throve well. Trouble from disease about average; less hoven in cattle on wild white pastures in the summer, but more in the autumn on red clover aftermath; fewer cases of mastitis in dairy herds; sheep maggot-fly not quite so troublesome as in some recent seasons; *Clip of Wool*—Rather under average in total weight; quality average.

ARGYLLSHIRE (Islands of Islay, Jura, and Colonsay). *Wheat*—None grown. *Barley*—None grown. *Oats*—Very good crop, averaging 44 bushels per acre and 42 lb. per bushel; straw was of good length; seed sown, 5 bushels per acre. *Harvest*—Began 23rd August, about a week later than average, but crops were well secured in spite of broken weather and the general yield was above the average in quantity and quality. *Hay*—Somewhat light, but an improvement on last year, yielding 22 cwt. to the acre in the case of ryegrass and 32 cwt. to the acre in the case of clover. *Meadow Hay*—More productive than last year. *Potatoes*—Similar to last year, giving about 8 tons per acre; disease was absent and lifting was carried out in mild weather; damage by insects, disease, or frost was negligible; new varieties were not planted. *Turnips*—Slight improvement on last year; 15½ tons per acre; crop brairded well, and only one sowing was necessary. *Insects*—No damage was suffered from injury by insects. *Weeds*—There was no unusual damage from weeds. *Pastures*—Growth was slow and cold weather in July retarded any improvement until shortly before a late harvest of hay, when permanent pasture rapidly improved. *Live Stock*—Poor pasture in spring and early summer affected stock, but a rapid improvement followed better growth about the middle of July. Cattle and sheep did not suffer unduly from disease, but maggot trouble was rather worse than last year. *Clip of Wool*—Average.

STIRLING DISTRICT.

DUMBARTONSHIRE (Upper). *Wheat*—None grown. *Barley*—None grown. *Oats*—Fairly good crop. *Harvest*—Began about a week before average time, but was troublesome to get in. *Hay*—Ryegrass hay was a lighter crop than last year, but was well got. *Meadow Hay*—An average crop and better got than last year. *Potatoes*—Were a lighter crop than last year, about 5½ tons per acre; the crop was free from disease; no new varieties planted. *Turnips*—Were a better crop than last year; brairded well; no resowing. *Insects*—No damage by insects. *Weeds*—Little damage by weeds. *Pastures*—Were fully average all season. *Live Stock*—Throve well and kept free from disease. *Clip of Wool*—Considerably lighter than last year.

DUMBARTONSHIRE (Lower). *Wheat*—A good average crop; yield about 43 bushels per acre; quality good, and harvested in good condition; straw was of good quality; yield, 25 cwt. per acre; seed sown, 3 to 4 bushels per acre. *Barley*—None grown. *Oats*—A particularly good crop; considerably heavier than last year; the quality of both grain and straw was good; yield—grain, 48 bushels per acre; straw, 23 cwt. per acre; seed sown, 5½ bushels per acre. *Harvest*—Grain ripened early, and harvesting commenced about ten days earlier than average. *Hay*—The yield of ryegrass hay was rather less than last year and the quality suffered because of unfavourable weather during harvesting; clover was an average yield; crop on average 1 ton 13 cwt. per acre. *Meadow Hay*—A bulkier crop than last year, but quality only fair. *Potatoes*—First earlies were a heavier crop than last year, digging about 10 tons per acre; main crop varieties did not bulk so well, averaging, when dressed, about 7 tons per acre; blight made its appearance in the middle of August and was widespread. *Turnips*—Crop not so bulky as last year, yielding about 16 tons per acre, and the quality suffered from finger-and-toe and mildew; the young plants brairded exceptionally well and there was no occasion for second sowing. *Insects*—All crops were exceptionally free from attacks by insect pests. *Weeds*—Redshank among the later singled fields of turnips was the weed that caused trouble during the season. *Pastures*—Were very good during the whole growing season and continued abundant to a later date than usual. *Live Stock*—Both sheep and cattle made good progress during the grazing season, especially toward the end of the season. Sheep were healthy, but maggots were troublesome during August; back-end calving cows and heifers suffered considerably from mastitis during the autumn months. *Clip of Wool*—Decidedly under average weight but the quality good.

STIRLINGSHIRE (West). *Wheat*—Crop thrashed hardly so well as last year; about 13 cwt. per acre; seed, 4 to 5 bushels per acre. *Barley*—None grown. *Oats*—A heavy crop, but some badly laid; thrashing out about 15 cwt. per acre; straw plentiful; seed, 6 to 7 bushels per acre. *Harvest*—Early, but somewhat prolonged by unsettled weather. *Hay*—A heavy crop, fully 30 cwt. per acre, but cutting was much delayed by bad weather; badly laid in places and mostly overripe. *Meadow Hay*—A better crop than last year, but late of being got and some of poor quality. *Potatoes*—A fair crop, 6 to 8 tons per acre; a little disease; a few Arran Luxury planted. *Turnips*—A fair average crop, about 18 tons per acre; good braird and little resowing. *Insects*—No injury recorded. *Weeds*—Less damage than usual. *Pastures*—Good. *Live Stock*—Throve very well, but some mastitis in dairy cows. *Clip of Wool*—Average.

STIRLINGSHIRE (East). *Wheat*—About 36 bushels per acre, average quality; straw, about 13 cwt. per acre. *Barley*—About 30 bushels per acre; fair crop; straw about 16 cwt. per acre. *Oats*—Good average crop; about 48 bushels per acre; straw, about 17 cwt. per acre. *Harvest*—Began about the middle of August. *Hay*—Good average crop; ryegrass about 30 cwt. per acre; timothy, 40 cwt. per acre. *Meadow Hay*—Average crop; well secured. *Potatoes*—Good average crop; usual varieties planted. *Turnips*—A fair average crop; swedes good. *Insects*—No unusual damage done. *Weeds*—Usual injury occurred. *Pastures*—Good average season for pastures. *Live Stock*—Did well. No disease reported. *Clip of Wool*—Average clip.

CLACKMANNANSHIRE. *Wheat*—Where the wheat was sown early the braird was quite good, and the crop was good, 35 to 40 bushels per acre; straw, 20 to 30 cwt. per acre; the late sown wheat was not so good as, owing to heavy rains, the ground got too wet and sodden. *Barley*—None grown. *Oats*—A good crop, with plenty of straw, ears well filled, and harvested in good condition; 35 to 40 bushels per acre; average weight, 40 to 42 lb. per bushel. *Harvest*—Began about the usual time. *Hay*—Was a big crop, 35 to 40 cwt. per acre, but the weather was very wet and the quality of the hay not too good. *Meadow Hay*—Very little grown. *Potatoes*—Kerr's Pink, 6 to 7 tons per acre; Golden Wonder, 5 to 6 tons per acre; no disease reported. *Turnips*—A good crop, 20 to 30 tons per acre; brairded well, only one sowing required; some finger-and-toe was present and also some dry-rot; a good many farmers, taking advantage of the subsidy, used lime to try to overcome these diseases. *Insects*—Practically no damage caused by turnip-fly. *Weeds*—Very little damage done by weeds. *Pastures*—The pastures were of average growth, and where they had been top-dressed with ground lime or basic slag they were very good. *Live Stock*—Were healthy and did well. Cattle and sheep were free from disease. *Clip of Wool*—A fair average.

PERTH DISTRICT.

PERTHSHIRE (Central). *Wheat*—Acreage sown about the same as last year; much better yield, 44 bushels per acre; straw, 25 cwt. per acre. *Barley*—Very little grown. *Oats*—About the same acreage as last year; yield much better, 44 to 48 bushels per acre; straw, 20 cwt. per acre. *Harvest*—Started cutting 17th August; finished leading 23rd September. There was much broken weather but very little damage to crop. *Hay*—Much better crop than last year; 1 ton 10 cwt. per acre; the early cut secured in fine condition, but later cut not so well got. *Meadow Hay*—A good crop, but much of it not well got. *Potatoes*—A very good crop; average, 8 tons per acre, the same as last year; some earlies had a good deal of disease, but very little experienced in main crop; lifting started earlier than usual, and most were lifted in fine condition. *Turnips*—An average crop, though not so good as last year; yellows, 16 to 20 tons per acre; swedes, 20 to 25 tons per acre; some disease among swedes; crop brairded well; no second sowing needed. *Insects*—No damage by insects. *Weeds*—Wet weather kept second hoeing back and allowed a lot of soft weeds to get up. *Pastures*—Extra good; much above average. *Live Stock*—Had plenty of grass and did well. Cattle and sheep were very free from disease. *Clip of Wool*—Average.

FIFESHIRE (Middle and Eastern). *Wheat*—Good crop, quite up to average yield, both for grain and straw; seed sown, 3 to 4 bushels per acre. *Barley*—Very good crop both for grain and straw; quality very good, 40 to 44 bushels per acre; seed sown, 3½ bushels per acre. *Oats*—Very good; some oats were very much laid and twisted before cutting, owing to wet weather and rainstorms, but on the whole the crop thrashed well; yield, about 56 bushels per acre; seed sown, 4 to 6 bushels per acre. *Harvest*—A good harvest; began at usual time, second week of August; weather was very wet and broken at first and there was some difficulty in getting the crop in. *Hay*—Clover hay was a very good crop, one of the best for many years; early cut hay was very good both for crop and quality, but the later cut got very wet weather and was badly spoilt and quality poor. *Meadow Hay*—None grown. *Potatoes*—About 2 tons per acre less than last year, but not so free of disease and broke; crop, 5½ to 6 tons per acre, seed and ware. *Turnips*—Variable; some swedes very good and others almost a failure; quality very good; crop brairded well; not much second sowing; on the whole, turnip crop was good. *Insects*—Damage not particularly severe. *Weeds*—Owing to wet weather through summer crops were hampered by weeds, especially quickens or couch-grass. *Pastures*—Were very good. *Live Stock*—Throve well and were free from disease. *Clip of Wool*—About average.

FIFESHIRE (Western). *Wheat*—Yield increased over previous year, the season having been favourable; 36 to 40 bushels per acre; straw, 30 to 35 cwt. per acre; seed sown, 3 to 4 bushels per acre. *Barley*—36 to 44 bushels per acre, generally of good quality; straw good and of average weight; seed sown, 3 to 4 bushels per acre. Not much barley grown except on best grain farms. *Oats*—Was perhaps one of the best crops for some years; if well sowed and of good quality yielded 48 to 56 bushels per acre; straw of good feeding value and a good average weight, estimated at 25 cwt. per acre; seed sown, 5 to 6 bushels per acre. *Harvest*—The commencement of harvest was earlier than the average. Operations were started during the second week in August and were general in the late districts by 25th August. At this date the weather broke and work was held up for ten days, during which time the grain crop suffered considerable damage by rain and high winds; in some instances the oat crop was not harvested. *Hay*—Harvest started in the second week of July, and was held up by broken weather, which caused a loss in weight; where the crop was secured in good order there was an average yield of 2 to 3 tons per acre. *Meadow Hay*—Where secured in good order gave an average weight. *Potatoes*—The potato crop was slightly under that of the previous year, averaging 5 to 6 tons per acre; the crop was secured under ideal conditions, and was more or less free from disease; no new varieties reported as grown. *Turnips*—Brairded well and no second sowing reported; the yield, however, was slightly less than the average of past years, 20 to 25 tons per acre; finger-and-toe disease on some land inclined to be sour and cold. *Weeds*—Crops generally on well-managed farms were free from weeds. *Pastures*—Were of sufficient quantity to carry the average head of stock. *Live Stock*—Throve well on the pastures as the feeding quality was good. Cattle and sheep were free from disease, but the maggot-fly pest still continued to cause trouble. One or two isolated cases of grass sickness in horses reported. *Clip of Wool*—Average, quality good.

PERTHSHIRE (Eastern). *Wheat*—Showed a considerable increase in acreage and was a good crop; threshed well; 36 to 42 bushels per acre; seed, 4 to 5 bushels per acre. *Barley*—An average crop, with an increased acreage; threshed well; 40 to 42 bushels per acre; samples were only moderate except where early harvested; seed, 3 to 4 bushels per acre. *Oats*—A very good crop, but on good land was badly laid, which delayed harvesting; samples were only fair owing to broken harvest weather; threshed very well; 55 to 75 bushels per acre; seed, 4 to 6 bushels per acre; straw plentiful. *Harvest*—Early; began about 11th August; very broken weather at first; the later districts got quite a good harvest. *Hay*—Crop was very good, being quite double that of last year; the crop, mostly ryegrass, was cut early and well secured, but the later cut was spoiled by weather; yield, 40 to 60 cwt. per acre. *Meadow Hay*—Crop good, but not well got. *Potatoes*—5 to 7 tons per acre, quite 2 tons per acre less than last year; have kept well in pits; not much disease except a little in King Edwards; no new varieties grown. *Turnips*—Swedes an average crop, 30 to 35 tons per acre; brairded well, with very little resowing; quite a good crop of yellows. *Insects*—No damage reported. *Weeds*—No damage where labour was available for hoeing. *Pastures*—Were abundant. *Live Stock*—Throve well. Cattle generally free from disease except one or two bad outbreaks of anthrax; sheep free from disease. *Clip of Wool*—Average.

PERTHSHIRE (Western). *Wheat*—Average crop of good quality; better than previous year; yield, 40 bushels per acre; straw, 20 cwt. per acre; secured in good condition; seed, 3½ to 4 bushels per acre. *Barley*—Very little grown. *Oats*—Crop above average; yield, 40 to 55 bushels per acre; straw, fair quality, 20 to 25 cwt. per acre. *Harvest*—Commenced middle of August in good weather; storm of wind and rain at beginning of September badly laid many good fields and made cutting difficult thereafter; very little damage by sprouting, and all secured in fair order. *Hay*—Timothy above average, 65 to 70 cwt. per acre; green cut, but softer quality than last year; less timothy cut for seed; all secured in good condition.

Ryegrass above average, 40 to 50 cwt. on carse and 25 to 35 cwt. on dry field; bad spell of weather, 3rd to 15th July. *Meadow Hay*—Heavier crop than last year; fairly well got. *Potatoes*—Good crop, 6 to 10 tons per acre, same as last year; many crops suffered from blight; no new varieties. *Turnips*—A good crop of good quality, 20 to 30 tons per acre; brairded well, and no second sowings required. *Insects*—No damage reported. *Weeds*—No damage. *Pastures*—Good quality, and more plentiful than last year and for a longer season. *Live Stock*—Throve better than usual. Cattle free from disease; a few cases of sheep-scab; maggots not so troublesome as last year. *Clip of Wool*—Average clip of good quality.

PERTHSHIRE (Highland). *Wheat*—Not generally sown; only a few acres grown on suitable farms. *Barley*—Only small patches grown for stock; weight light. *Oats*—Crop above average with straw of fair quality; natural weight about 42 lb. per bushel; seed sown, 6 bushels per acre on an average. *Harvest*—Began at the usual time and in most cases was completed by the end of September except on very late high land; where previously laid, grain and straw were inferior in quality. *Hay*—Crop above average and well secured; 30 cwt. per acre; aftermath of clover light. *Meadow Hay*—Above average as to quantity and of good quality. *Potatoes*—A very good crop secured under ideal weather conditions; about 7 to 8 tons per acre; not much disease apparent; no new varieties planted to any extent. *Turnips*—A good crop; brairded well, and no second sowing; about 18 tons per acre. *Insects*—No damage done. *Weeds*—Very few, and where they appeared were easily dealt with. *Pastures*—Of average growth and quality. *Live Stock*—Throve well; free from disease. *Clip of Wool*—A good average quality; weather conditions fine during clipping season.

ABERDEEN DISTRICT.

ANGUS (Western). *Wheat*—30 bushels per acre; grain and straw good quality; seed sown, 3 to 4 bushels per acre, drilled. *Barley*—38 bushels per acre; grain and straw good quality; seed, 3 to 4 bushels per acre, drilled. *Oats*—50 bushels per acre; good quality and plenty of straw; seed, 5 to 7 bushels per acre according to variety and district. *Harvest*—Began about the beginning of August; weather broke later but did no damage to crops. *Hay*—About 2 tons per acre; quality not so good as last year; a lot spoilt by bad weather. *Meadow Hay*—Very little grown. *Potatoes*—8 tons per acre; much disease in King Edwards; blight started about the middle of September and spraying did no good. *Turnips*—17 tons per acre; a lot of finger-and-toe disease; some fields were almost wholly destroyed by it; no resowing necessary and plants came away well to begin with. *Insects*—No more damage than usual. *Weeds*—Damage about the usual. *Pastures*—Very good both for growth and quality. *Live Stock*—Throve very well and were free from disease except for a few cases of anthrax. *Clip of Wool*—Good and above the average.

ANGUS (Eastern). *Wheat*—About 34 bushels per acre; owing to wet weather in winter and a late cold hard spring, wheat on stiffish land suffered badly and did not thrash out to its appearance; seed sown, 3½ to 4 bushels per acre. *Barley*—About 40 bushels per acre; wet weather in August was against a really good thrash-out and the crop was under average, but was very well harvested; straw was abundant; seed sown, 3 to 3½ bushels per acre. *Oats*—Average about 52 bushels per acre; many very good crops did not turn out to expectations; straw very good and plentiful. *Harvest*—Began just about the usual time, last week of August. *Hay*—Was a very good crop and as a rule very well got with plenty of clover in it; yield, 3 tons per acre, and in some cases more. *Meadow Hay*—Practically none grown. *Potatoes*—Crops very varied; much short of last year and in early varieties a good deal of disease; King Edwards a poor, blighty crop, about 5 tons per acre; main crops fair, about 8 tons per acre and not very badly diseased; disease began about end of July, but was checked by dry weather later. *Turnips*—Crops very varied; a great deal of finger-and-toe and utter failure in some fields; others where sound did very well and lifted quite 30 tons per acre; not much second sowing, but some crops died away after being singled; open weather in autumn greatly improved the healthy crops. *Insects*—Damage slight; wood pigeons increased greatly and did great damage to young turnips and grain. *Weeds*—Were more difficult to overcome and land generally dirtier and not so well worked as before the war. *Pastures*—Were very good and stood out well all the season; came early in spring and stayed long in autumn. *Live Stock*—Did well all the year and were quite free from disease. *Clip of Wool*—Heavy and of good quality.

KINCARDINESHIRE. *Wheat*—32 to 48 bushels per acre; grain and straw of good quality, but crop generally thin on the ground; yield variable; seed, 3½ to 4 bushels per acre. *Barley*—32 to 56 bushels per acre; a good quality crop, but not much grown; seed sown, 3 to 4 bushels per acre. *Oats*—40 to 80 bushels per acre; good crop; better than last year, but much grain darkened by getting wet in the stook and being lodged before harvest; seed, 5 to 8 bushels per acre. *Harvest*—Began about average time, but was later than the last few years. *Hay*—2 to 3 tons per acre; quality very good at coast side and secured in very good order; inland much was spoilt by wet after being cut. *Meadow Hay*—None grown. *Potatoes*—7 to 10 tons per acre; disease in softer varieties began in September; Arran Pilot and Redskin, new varieties, gave good results. *Turnips*—8 to 30 tons per acre; finger-and-toe disease prevalent; crop brairded well; no resowing. *Insects*—Wireworm appeared to be more numerous; other insects not more than usual; damage done by crows. *Weeds*—Damage on the increase, especially on green crops, due no doubt to shortage of labour for hand hoeing. *Pastures*—Average; very poor previous year owing to drought. *Live Stock*—Did very well and were free from disease. *Clip of Wool*—Very good; above average.

ABERDEENSHIRE (Buchan). *Wheat*—None grown. *Barley*—Good crop; 40 bushels per acre. *Oats*—Good crop of straw; grain 40 bushels per acre; not quite so rich as last year. *Harvest*—Started about 20th August; crop secured in good order; almost a record. *Hay*—A splendid crop, well secured, from 2 to 3 tons per acre. *Meadow Hay*—None grown. *Potatoes*—From 5 to 8 tons per acre; somewhat similar to last year; not so much disease as last year; no new varieties planted so far as known. *Turnips*—From 15 to 20 tons swedes, 12 to 15 tons yellows per acre; about the same as last year; the crop brairded well. *Insects*—Some damage by worms; not so bad as last year. *Weeds*—No injury to any extent. *Pastures*—Up to last year's average. *Live Stock*—Throve well and were free from disease. *Clip of Wool*—An average weight and quality.

ABERDEENSHIRE (Central). *Wheat*—36 to 38 bushels per acre; seed sown, 3 to 3½ bushels per acre, mostly sown with drill machine; quality of both grain and straw not quite so good as last year. *Barley*—40 to 42 bushels per acre; rather more than last year; general average of bushel weights, 55 to 56 lb., about 2 lb. better than last year; seed sown, 3 to 3½ bushels per acre where sown by drill machine, and 4 bushels per acre where sown broadcast by machine or hand sown. *Oats*—36 to 40 bushels per acre; a wider range than usual and quality more varied, with a very wide range of bushel weights, 36 to 46 lb.; average, 41 lb.; straw, about 17 to 18 cwt. per acre, rather less than last year; seed sown—Potato and all thin-husked varieties, 4½ to 5 bushels per acre where sown by drill machine, 1 to 1½ bushels more where sown by broadcast machine or hand; all thick-husked varieties 1 to 1½ bushels more per acre. *Harvest*—Commenced about the usual time, September-October, and was generally completed by the end of the first week of October. *Hay*—18 to 22 cwt. per acre; quality rather better than last year and fairly well mixed with clover. *Meadow Hay*—Much about the same as last year. *Potatoes*—7 to 8 tons per acre, very similar to last year, but quality not so good; disease reported, but not to a large extent; no mention of new varieties. *Turnips*—12 to 14 tons per acre; crop brairded well, but early sown fields did not do so well as the later; quality varied; no report of new varieties sown; disease reported, but not to large extent. *Insects*—Not more than generally prevalent. *Weeds*—No injury reported. *Pastures*—Up to average. *Live Stock*—Did well and were free from disease. *Clip of Wool*—Fairly good and average.

ABERDEENSHIRE (Strathbogie). *Wheat*—None grown. *Barley*—Average quantity grown and crops quite good; yield, 32 to 42 bushels per acre, weighing 55 lb. per bushel; 4 bushels per acre were sown. *Oats*—Over all, crops better than last year; very well harvested, but yield below average; 48 bushels per acre, 42 lb. per bushel. *Harvest*—Began early and finished early; best harvesting season for many years. *Hay*—Mostly grown for home consumption. *Meadow Hay*—None grown. *Potatoes*—Were of good quality, but yield was below the average; no new varieties were grown; the staple crop was Kerr's Pink, and the quality this year was above average; favourably gathered. *Turnips*—Crop this year quite satisfactory and no resowing required; some have suffered from finger-and-toe disease; swedes especially have been worm-eaten. *Insects*—No trouble with grub or insect apart from the disease in turnips. *Weeds*—No trouble experienced; weather favourable for cleaning the land. *Pastures*—Abundant this season, and lasted well into the autumn. *Live Stock*—Did well on pastures and were free from disease. *Clip of Wool*—Good quality and average quantity. *General Remarks*—Good year for all crops generally. It was very wet in the spring and sowing was delayed for a few weeks. When the weather changed, however, things progressed rapidly.

BANFFSHIRE (Lower). *Wheat*—Acreage grown about the same as last year; yield, 40 bushels per acre; seed sown, about 4½ bushels per acre; straw, 25 cwt. per acre. *Barley*—Crop all over better than last year and of very good quality, yielding 40 to 48 bushels per acre, natural weight being 56 to 57 lb. per bushel; straw, 20 cwt. per acre, of good quality, the crop being well harvested; seed sown, 4 bushels per acre. *Oats*—Yield, 48 to 56 bushels per acre; natural weight 42 to 44 lb. per bushel; straw, 25 cwt. per acre, of fine quality and fully more than last year; seed sown, 6 bushels per acre, and about 8 bushels per acre of the thick-skinned varieties. *Harvest*—Began earlier than usual. *Hay*—Crop up to average, from 35 to 40 cwt.; harvested in fair condition. *Meadow Hay*—Very little grown; blight affected the earlier varieties. *Potatoes*—Crop yielded 7 to 8 tons per acre; Arran Pilot, Arran Signet, and Arran Peak were among the newer varieties planted, and all did well. *Turnips*—Not quite up to average; about 14 to 15 tons per acre; crop brairded well; there was very little second sowing. *Insects*—Turnips were again affected, but in a larger degree, by the maggot-worm. *Weeds*—No damage caused. *Pastures*—Were very good throughout the season. *Live Stock*—Did well and were free from disease. *Clip of Wool*—Up to average.

BANFFSHIRE (Upper). *Wheat*—None grown. *Barley*—Very little grown; merely an acre or two used as feed for young bulls. *Oats*—A good crop on a very restricted acreage; quantity, 40 to 48 bushels per acre; bushel weight somewhat lighter on an average, 40 to 41 lb.; straw in great abundance. *Harvest*—Commenced the first week of September, fully a week later than last year. *Hay*—Somewhat light owing to the month of May being dry; clover did not stack so well; yield, about 1½ to 2 tons per acre. *Meadow Hay*—Very little grown, but came in handy when other pastures failed somewhat in August. *Potatoes*—Good crop, but some disease prevalent; only grown for home consumption; common varieties, Kerr's Pink and Keppleton Kidney. *Turnips*—Good quality turnip crop, 12 to 15 tons per acre; brairded well except on stiff clayey soils, and in such cases resowing was common. *Insects*—Only one report, from Keith district, of a serious root pest which reduced the feeding properties of the crop. *Weeds*—Checked by dry weather, which enabled cultivation to proceed with comparative ease. *Pastures*—Came away green and fresh by the middle of April, particularly early for this part of the country. *Live Stock*—Cattle and sheep did well in the grass season, but sheep suffered a little from maggot-fly. *Clip of Wool*—Under the average, owing to very wintry spring conditions.

INVERNESS DISTRICT.

MORAYSHIRE. *Wheat*—A good crop, 21 cwt. per acre; straw, 30 cwt. per acre; seed sown, 3 to 4 bushels per acre. *Barley*—A nice crop, 18 cwt. per acre; quality good; straw, 20 cwt. per acre, good quality; seed sown, 3 to 4 bushels per acre. *Oats*—18 cwt. per acre on Lower Moray; not yielding so well on the higher ground, about 14 cwt. per acre; straw good, 22 cwt. per acre; seed sown, from 4 to 7 bushels per acre, according to variety and whether drilled or broadcast. *Harvest*—A day or two later than last year. *Hay*—30 cwt. per acre; good quality; much better than last year. *Meadow Hay*—Very little grown; average yield. *Potatoes*—5½ tons per acre, rather less than last year; some blight, but not serious; no new varieties grown. *Turnips*—Not so good as last year; 10 to 20 tons per acre, according to locality and other conditions; some complaints of bulbs rotting; the crop brairded well; very little resowing. The disease known as raan in turnips caused most concern. *Insects*—Damage not more than usual. *Weeds*—Some turnip fields rather weedy; couch-grass mostly, more than usual. *Pastures*—Fair average growth, quality very good. *Live Stock*—Did well; disease not more prevalent than usual. *Clip of Wool*—Very good; both quantity and quality above average.

NAIRNSHIRE. *Wheat*—Yield, about 44 bushels per acre; 4 bushels per acre sown. *Barley*—Yield, 40 bushels per acre; 4 bushels per acre sown. *Oats*—Yield, 64 to 72 bushels per acre; about 6 to 7 bushels per acre sown. *Harvest*—About usual time. *Hay*—Crop, 1¼ tons per acre. *Meadow Hay*—Not grown. *Potatoes*—Yield, 7 tons per acre; little or no disease reported. *Turnips*—Not nearly so good as last year; yield under 20 tons per acre; brairded well; no second sowing. *Insects*—No injury caused. *Weeds*—No injury reported. *Pastures*—Excellent; much better than last year. *Live Stock*—Throve well and were free from disease. *Clip of Wool*—About average.

INVERNESS-SHIRE (Inverness). *Wheat*—A very good crop; excellent quality and weight; return per acre, 48 bushels, and more in some cases. *Barley*—Very good crop; weight per bushel up to 57 lb., 56 lb. being quite common; quality very good, except where dark in colour owing to smut. *Oats*—A very good crop where sown early, and average return per acre; quality very good. *Harvest*—About a week earlier than 1936; the weather during the harvest was of the best. *Hay*—A good crop, with an average yield of 2 tons per acre of good quality. *Meadow Hay*—A good crop; in good order when secured early. *Potatoes*—Above the average; some of the early varieties produced 9 tons per acre. *Turnips*—Some complaints of finger-and-toe, but on the farms clear of that were a very good crop and kept well. *Insects*—Not much injury recorded. *Weeds*—No damage done. *Pastures*—Good, and the open back-end gave a long grazing season. *Live Stock*—Did very well and were free from disease; tick in sheep stock caused serious trouble.

INVERNESS-SHIRE (Skye). *Wheat*—None grown. *Barley*—None grown. *Oats*—The heaviest crop for several years and secured in good condition. *Harvest*—Began about the same time as last year, 23rd August. *Hay*—Heavier and earlier than last year; quality quite satisfactory; secured in good condition. *Meadow Hay*—A good crop, but scarcely so bulky as last year. *Potatoes*—A good crop, both as to quantity and quality; some wart disease noticeable. *Turnips*—The area under turnips was small, but there was quite a satisfactory crop; brairded well; no second sowing necessary. *Insects*—Not much damage done. *Weeds*—Some damage, but not great where the land was properly cultivated. *Pastures*—Were quite good all the season; better than last year. *Live Stock*—All grazing cattle throve well. There were several cases of disease among cattle, particularly during May and June; sheep kept fairly sound, except for trembling in April and May. *Clip of Wool*—Quality and quantity about average.

INVERNESS-SHIRE (Lochaber). *Wheat*—None grown. *Barley*—None grown. *Oats*—Very good crop; all secured early in very good condition; seed sown, about 6 bushels per acre. *Harvest*—Started about the end of August, and although the weather was broken early in September and harvest delayed about ten days, little damage was done to crops. *Hay*—Ryegrass and clover were a little under the average owing to the dry weather during the early part of the season. *Meadow Hay*—Was a light crop up till the beginning of July, but it came away very well and turned out a good crop rather later than usual; bulked well and secured in very good order. *Potatoes*—Under the average in most cases, but a very healthy crop, clear of disease; Kerr's Pink and Golden Wonder were the principal varieties planted. *Turnips*—Under the average; free from disease; no second sowing required. *Insects*—Very little damage recorded. *Weeds*—Made little progress owing to the nature of the season. *Pastures*—Well over the average. *Live Stock*—Did very well on the grass right on till November. Cattle and sheep very clear of disease and in exceptionally good condition. *Clip of Wool*—Average, and clean, generally.

ROSS-SHIRE (Dingwall and Munlochy). *Wheat*—Not so much sown; yield, 36 to 48 bushels per acre. *Barley*—More barley grown; yield, 36 to 48 bushels per acre; quality of grain good; more straw than last year; seed sown, 3 to 4 bushels per acre. *Oats*—Bulked well and thrashed better than last year; quality good; yield, 40 to 80 bushels per acre. *Harvest*—Took place at the normal time; weather was broken to start with, but gradually improved. *Hay*—Crop was heavier than last year and the quality good; 20 to 45 cwt. per acre. *Meadow Hay*—Practically none grown. *Potatoes*—King Edwards did not bulk, but other varieties compared favourably with last year; some of the early varieties were badly affected by disease; yield, 4 to 10 tons per acre; new varieties grown, Arran Pilot and Doon Early; both very promising. *Turnips*—Yield was about average, but early frost in many cases ruined the crop; practically no resowing and crop brairded well; average production—yellows, 10 to 25 tons per acre; swedes, 15 to 35 tons per acre. *Insects*—No damage caused. *Weeds*—No injury recorded. *Pastures*—Average growth, but the pastures were heavier than last year at the back-end. *Live Stock*—All throve well on pasture, and kept free from disease. *Clip of Wool*—Quality good; over the average.

ROSS-SHIRE (Tain, Cromarty, and Invergordon). *Wheat*—A good average crop, and thrashed on most farms very well; average, 40 bushels per acre on reasonably good wheat lands; 4 bushels per acre sown. *Barley*—Yield, 40 to 56 bushels per acre, weight 54 to 57 lb. per bushel; straw, a fair crop; quality and colour good; seed, 3½ to 4 bushels per acre; barley of the Gold description thrashed exceptionally well. *Oats*—On good land a very seedy crop of good quality grain; 40 to 56 bushels per acre; colour good; straw generally good; seed, 4 to 8 bushels per acre, according to variety. *Harvest*—Began generally about 20th August. *Hay*—A very light crop except on very good land; quality very good. *Meadow Hay*—None or little grown. *Potatoes*—Were rather a mixed crop in tonnage; a good deal of blight, and spraying was resorted to extensively; 4½ to 7 tons about the average crop per acre; odd fields of King Edward and Majestic, 8 to 10 tons per acre. *Turnips*—A disappointing crop generally; promised well, but the maggot-fly did very great damage, especially to early grown swedes; finger-and-toe very prevalent; swedes, 18 to 20 tons per acre; yellows, 15 to 18 tons per acre. *Insects*—The ordinary fly on turnips was not too bad, but the maggot-fly came along about two weeks later and caused great anxiety. *Weeds*—Land fairly clean. *Pastures*—Good land grazed well, but the weather was on the dry side and affected lighter land. *Live Stock*—Cattle and sheep grazed quite well. Fewer worms in lambs than usual, mainly on account of farmers resorting to early dosing. Cattle and sheep free from disease generally. *Clip of Wool*—Rather light.

SUTHERLANDSHIRE. *Wheat*—None grown. *Barley*—A good crop; not grown to a large extent; with distilleries working again should be sown on a larger scale next year. *Oats*—A good crop in most districts, except on poor land where it was affected by the dry summer. *Harvest*—Was very early and was got into the stackyard in splendid order, even in the West Coast districts. *Hay*—A good crop on heavy land; fair on light land; got in in good order in most places. *Meadow Hay*—Not a heavy crop, but secured in good order. *Potatoes*—A very good crop; no disease to speak of; new varieties did very well. *Turnips*—A good crop in most districts, but did not keep very well; the hard frost in December played havoc with those not secured; some resowing necessary owing to dry weather. *Insects*—Did not do much harm. *Weeds*—Crops not injured to a great extent; weeds were easily kept down. *Pastures*—Good, and continued so till December. *Live Stock*—Sheep did very well; a big crop of lambs owing to good lambing weather and plenty of milk; they were very good by sale time; cattle also did well. Cattle and sheep free from disease; maggots not so bad as last year in most places. *Clip of Wool*—A good clip on the whole, except on high ground where sheep were thin and lost the wool; quality good generally.

CAITHNESS-SHIRE. *Wheat*—Small quantities grown; where grown crops were average; 60 bushels per acre; grain and straw good quality; seed sown, 4 bushels per acre. *Barley*—Not much grown; crops were similar to last year; yield, 40 to 44 bushels per acre; quality of grain and straw average; seed sown, 4 bushels per acre. *Oats*—Rather better than last year; yield, 40 bushels per acre; straw, 2 tons per acre; seed sown, 4 to 7 bushels per acre. *Harvest*—Began a week earlier than usual; cutting was general by the 1st of September; crop ripened irregularly, some fields were ripe early, others not ripe until last week of September; weather was favourable throughout. *Hay*—An average crop; quality good; average quantity 2 to 3 tons per acre. *Meadow Hay*—An average crop; similar to last year. *Potatoes*—Better than last year; tubers were bigger; disease more evident than last year, beginning about the third week of August; yield, 6 to 8 tons per acre; some new varieties planted experimentally. *Turnips*—A good crop and of good quality; yield, 28 to 30 tons per acre of swedes; yellows, 25 tons per acre; crop brairded well; no resowing necessary. *Insects*—Some fields showed evidence of grub, but the damage was slight. *Weeds*—Prevalent in cereal crops and pastures; thistles, charlock, spurry, sorrel, corn-marigold, and knotgrass; damage not greater than usual. *Pastures*—Growth was earlier than last year, and continued good throughout the season. *Live Stock*—Throve well on pasture; cattle and sheep made good progress. Cattle were free from disease; sheep were subject to attack by the maggot-fly. *Clip of Wool*—Average and of good quality.

ORKNEY. *Wheat*—None grown. *Barley*—Yield—grain, 33 to 36 bushels per acre; straw, 25 to 26 cwt. per acre; bushel weight, 50 to 52 lb.; seeding, 2½ to 3½ bushels per acre. *Oats*—Yield, 45 to 50 bushels per acre; straw, 28 to 30 cwt. per acre; both quality and quantity slightly above average; seeding, 4½ to 6 bushels, depending on variety sown; pure lime Potato oats most popular variety in this county. *Harvest*—Commenced about usual time. *Hay*—Crop slightly above average, about 35 to 40 cwt. per acre; clover was fairly plentiful in most districts and the crop was harvested under good conditions. *Meadow Hay*—Crop similar to last year. *Potatoes*—A good crop in most districts; yield, 6 to 8 tons per acre; some damage by blight in certain districts; lifting completed about mid-November; crop, excellent quality. *Turnips*—Yield, 20 to 30 tons per acre, according to district and quality of soil; turnips and swedes good quality, but damage by turnip-root fly reported in a number of districts; crop brairded well in all districts. *Insects*—Turnip-root fly caused some damage in most districts; there was also some damage to potatoes by larvæ of the Ghost Swift Moth. *Weeds*—No damage reported. *Pastures*—Plentiful in all districts and of excellent quality. *Live Stock*—All classes made good progress throughout the season. Cattle and sheep were free from disease. *Clip of Wool*—Crop slightly below average.

SHETLAND. *Wheat*—None grown. *Barley*—None grown. *Bere*—A healthy crop with considerably more straw than last year; yield of grain, 27 bushels per acre of 51 lb. weight per bushel; quality of grain well up to average; seed sown, 4 bushels per acre. *Oats*—

Yield of grain not so good as last year, about 34 bushels per acre; weight, 36 to 40 lb. per bushel; yield of straw decidedly better than last year; seed sown, 4 to 6 bushels per acre; sowing completed at usual time, about end of April. *Harvest*—Harvesting of bere commenced about third week in August, and oats about second week in September; during the whole duration of the harvest weather was slow and broken, especially during carting, which resulted in a very protracted harvest with crop in only fair condition. *Hay*—Crop below average; clover thin owing to the damage done by sea spray during the winter-time; ryegrass filled up fairly well and yields of hay from 20 to 25 cwt. per acre were recorded. *Meadow Hay*—Well up to average, and yield heavier than last year; 18 to 22 cwt. per acre recorded; crop difficult to secure owing to weather conditions. *Potatoes*—Below average; from 4 to 5 tons per acre; potato blight prevalent amongst earlies, and spraying resorted to; the new variety Redskin continued to give satisfactory yields. *Turnips*—The yield varied considerably, but on an average varied from 17 to 20 tons per acre; crop brairded well, and no resowing was required; after broken weather during cleaning operations, finger-and-toe was prevalent. *Insects*—Cabbage-root fly attacked cabbage plants generally, and the damage was about average; turnip-root fly was also reported from Skeld, Brae, and Bressay areas; damage caused by the potato-miner was also reported, and grub was evident in some patches of oats. *Weeds*—Charlock caused serious damage to the oat crop in certain areas. *Pastures*—Growth was late in all districts, due to the damage done by sea spray during the previous winter; in many places the heather did not make a complete recovery during the summer. *Live Stock*—All classes of stock did well considering the lateness of the pastures in spring, and by the time of the autumn sales were in good condition. Cattle and sheep were free from disease. *Clip of Wool*—The quality was up to average, and yield was about average; demand only fair, 1s. 9d. per lb. for white and black pure Shetland, and about 2s. for moorit.

THE WEATHER OF SCOTLAND IN 1937.

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THIS report consists of (1) a general description of the weather from month to month, and (2) a selection of rainfall returns in which each county of Scotland is represented by one or more stations. Temperature readings, unless otherwise stated, are from the thermometers exposed in the regulation "Stevenson Screen."

JANUARY.

Outstanding features of the first month of the year were the succession of gales, the very high rainfall in eastern districts, and, except towards the end of the month, the comparative absence of really cold weather for this season of the year. Gales were reported on every day from one part or another of Scotland, the areas chiefly affected being Shetland and Orkney, North-East Scotland, and the western seaboard. January in Orkney was one of the stormiest months within living memory, a succession of whole gales occasioning most tempestuous seas and considerable coast erosion. In the course of the month gusts of gale force or over were registered at Kirkwall during 395 hours. The Caithness coast suffered similarly. Many of these gales blew from southerly and south-easterly points.

Mean temperature was above the normal for the month, mostly by between one and two degrees; the central part of the country in particular was not so cold as is generally the case at this time of the year. The departure from normal was greatest in western Inverness, Perth, and the Borders. Except towards the end of the month mild days predominated, the highest temperatures recorded being 59° F. at Glenbranter on the 22nd and 58° F. at some other places. At ordinary levels there were no exceptionally cold days; the lowest night temperatures were, as usual, recorded at high level stations—namely, 19° F. at Dalwhinnie on the 19th, 21° F. at Braemar and 22° F. at Balmoral on the 14th, and 22° F. at Eskdalemuir on the 8th. In a rather cold period towards the end of the month night temperatures of 25° F. to 30° F. were not infrequently registered. Ground frosts were fairly frequent in inland districts, the coldest record from an exposed thermometer on the ground being 11° F. at Dalwhinnie on the 19th.

Rainfall without exception was above normal. In upper Deeside about four times the normal amount of rain fell; a total of 13·1 inches at Braemar was the highest recorded in any month since records began to be kept there in 1866, and the fall at Aberdeen was the highest for January since records began in 1871. The unusual excess of rain on the south-eastern slopes of the Grampians was a consequence of the remarkable excess of south-easterly winds which characterised the month. A very large part of the upland areas all over Scotland, however, had 12 or more inches of rain, whilst in the wet district of Kinlochquoich 20·79 inches fell. Falls exceeding 2 inches in a day occurred in the Highlands on the 1st, 3rd, 4th, and 24th. On the last-mentioned date there was serious flooding in Deeside and in Angus and Strathmore. The amounts of snow during the month were mostly small, but in the snowstorm of 29th to 30th, with a high wind, there was much drifting, and some of the higher roads in southern, eastern, and central Scotland were blocked.

Sunshine was mostly below normal, but not by a great amount, and in a few cases totals slightly over normal were recorded.

FEBRUARY.

In all parts of the country, except the extreme west, the rainfall of February was well above normal, and yet the amounts of bright sunshine were in most cases outstandingly high. Gales occurred, mainly in the northern and western coastal districts, between the 1st and the 9th and between the 13th and 28th.

Temperature in the north was about two degrees below normal, and in the south was practically normal for the month. Moderately high day temperatures for the season were reached on a few days, the highest being 55° F. at Stirling on the 17th. On the other hand, at one or two high level stations near the end of the month even the day temperature failed to rise above freezing point. The lowest air temperatures recorded were 11° F. at Braemar and 16° F. at Balmoral and Dalwhinnie on the 24th, and the lowest temperatures recorded on the exposed ground were 6° F. at Braemar on the 24th and 9° F. at Balmoral on the 12th. Ground frost occurred with great frequency, especially at high level stations.

Rainfall exceeded the normal by 50 to 80 per cent in the south-eastern counties, in Lanarkshire, and in the extreme north-eastern districts. At not a few places in Scotland, as well as in England, the total for January and February taken together was greater than for some thirty years. Locally, on the west coast and in the Hebrides, the rainfall of February was, however, below normal. The wettest periods in the month were around the 4th, 8th, and 27th, but no fall exceeding 2 inches in a day was reported. Snow occurred fairly frequently, particularly from 8th to 10th and 25th to 28th. In upper Deeside it lay on the ground practically throughout the month. At lower level stations snow did not lie long at any time unless following the snowstorm of the 27th, which, accompanied by a northerly gale of great violence, blocked roads in almost all parts of the country. Drifts of 4 to 5 feet deep were commonly reported, and undrifted depths ranged from 4 to 13 inches.

Sunshine over the country averaged about an hour per day above the normal, and, curiously enough, the regions of greatest excess of rain had a very large excess of sun. In Edinburgh it was the sunniest February since 1907, and at Aberdeen the sunniest since 1908.

MARCH.

Temperature in the mean for Scotland was more than four degrees below normal, making the month the coldest March since 1919; and it is worth recalling that March 1919 was the coldest for at least sixty years. This low average temperature resulted not so much from excessive cold at any time as from an unusual persistence of cold and an entire absence of any real warmth. Except for a temperature of 55° F. reached at Kilmarnock on the 19th and at Montrose on the 28th there was no other case of even 53° F. being surpassed. The only other year when March in Scotland has produced no higher temperature than 55° F. was 1919. On some days, especially around the 11th to 13th, the afternoon temperatures reached only about 35° F. The lowest temperatures recorded in standard screens during the month were zero at Dalwhinnie and Braemar on the 8th; and this is the lowest in any March since 1917. On the exposed ground on the same date temperature went down to two degrees below zero Fahrenheit at Braemar. At several places on high ground in inland districts ground frost occurred on from twenty-three to twenty-eight nights.

Much of the precipitation was in the form of snow, but over most of Scotland the precipitation was scanty. It exceeded the normal, however, in an area along the east side of the country from Berwickshire to Banff. On high ground snow lay throughout the month, and at Balmoral the undrifted depths were estimated at from 9 to 18 inches. The most severe storm was that of the 12th to 14th, with a north-easterly gale, when railway lines as well as roads were snowed up and drifts to a depth of 10 or 12 feet were reported in places. In the latter part of the month also much snow fell in north-eastern districts, where, it is said, there has not been such a period of protracted drifting since 1838.

Sunshine was deficient in the eastern part of the country by from ten to twenty hours on the month's total, but in the west and the north-west the sunshine aggregates were very good. At Duntuilm in Skye the recorded total was 144 hours, and at Oban 143 hours.

APRIL.

April was relatively mild and, in the north and north-west, very dry, but it was on the whole a remarkably dull and cloudy month, with little sunshine until the last ten days.

The mean temperature, in striking contrast to that of March, was some 3° F. above normal in western and north-western districts, and elsewhere 1° to 2° F. above normal. The warmest weather was in the last five days of the month, 71° F. being reached at Forres and Logie Coldstone, and 70° F. at Dundee and Perth on the 30th. Just at the beginning of this period the coldest nights at many places occurred. The lowest air temperatures were 21° F. at Dalwhinnie, and 27° F. at Braemar and West Linton on the 26th. Ground frost occurred fairly frequently in the first week and in the last ten days at high-level stations, but stations on low ground had generally only three or four nights of ground frost.

Except locally on the Angus and Fife coasts and in parts of South-West Scotland there was a deficiency of rainfall. Northern and north-western districts received 50 per cent to 20 per cent or even less of the average April fall. The last ten days of the month were the driest and finest. The heaviest falls of rain were around the 7th to the 9th and the 15th, but no specially heavy falls occurred. Fresh snow was not reported at levels below 2000 feet, though the snow of the previous month continued to lie on the ground during the first seven days of April at Dalwhinnie and for nine days at Braemar.

On the east coast, between the 3rd and the 8th and 14th to 16th, fog and mist were rather prevalent.

MAY.

The month was the warmest May in Scotland since 1919, the mean temperature for the country as a whole being about two degrees above the normal for the time of year. The warmest day was the 29th, when 75° F. was reached at Forres and Gordon Castle and 74° F. at Kelso and Dunbar. Even the night temperature on this date fell only to 59° F. at Gordon Castle and 57° F. at Kilmarnock. Around the 5th and 6th, and from the 9th to the 13th, day temperatures were rather low. The lowest night temperatures recorded were 24° F. at Dalwhinnie on the 13th and 26° F. at Balmoral and Logie Coldstone on the 11th.

Except in Shetland, a considerable part of South-East and East Scotland, and a small area of Argyll the rainfall was below normal for the third month in succession. The greatest deficiency was in Orkney, which had the lowest May rainfall for at least eighty years. Parts of Sutherland and Caithness had less than half the average fall, but elsewhere the deficiency was not very great. In the places which had an excess this arose entirely from the heavy fall on the 21st.

Over the greater part of Scotland there was abundant sunshine, but in Shetland and Dumfriesshire there was an appreciable deficiency. The largest amounts were recorded in the Western Isles, 267 hours at Tiree and 259 hours at Duntuilm in Skye.

Fog of the coastal type occurred along practically the whole of the east coast on the 2nd and 3rd. On the evening of the 17th in Kinross a severe thunderstorm accompanied by rain and hail caused flooding and damage to property and gardens, hailstones lying on the ground to a depth of 6 inches. Storms were also reported rather widely in eastern counties on the 21st.

JUNE.

The weather of June showed no consistently outstanding features, but considerable variation with locality.

The mean temperature on the east coast was well above normal; elsewhere the departures from normal were insignificant, except in places in the south-west where weather was slightly cooler than usual. In the eastern half of the country the warmest day was generally the 25th, when 78° F. was recorded at Montrose, Balmoral, and Logie Coldstone, and 77° F. at Dundee. In western districts no temperature exceeding 72° F. was reached. The month opened with rather cold weather with maximum day temperatures of only 50° F. to 55° F. At some exposed places ground frost was recorded in the opening days, and again from the 21st to 24th. On the last-mentioned date a temperature of 28° F. was recorded in the screen at Dalwhinnie and a temperature of 22° F. on the ground.

Rainfall was more abundant than usual in the west and north, and at a few places in Angus and Fife, but in the south-east of the country and over a large part of Perthshire and Aberdeenshire and in parts of Inverness-shire the fall was below normal. An unusual variation with locality occurred, Lerwick receiving 241 per cent of its June average and Balmoral only 43 per cent. Many parts of the country had almost no rain from the 7th to the 25th; the monthly fall was in fact made up largely of some heavy falls between the 3rd and 6th and again around the 26th to 28th. Special mention may be made of a fall of 2·76 inches at Kinlochquoich on the 27th, followed by 2·10 inches on the 28th.

The duration of bright sunshine also varied irregularly, being below the June average, except locally at Aberdeen, Inverness, and in the Clyde Valley.

JULY.

Excessive rainfall over a considerable part of Scotland and a very general deficiency of sunshine were the notable features of the weather of July.

The *mean temperature* was slightly below *normal* in the west and rather above in the east. Almost without exception the warmest days were in the fine period from 15th to 19th or in the last days of the month. On the 31st 80° F. was recorded at Kelso, 78° F. at Carnoustie, and 77° F. at other places. The warmest night of the year up to this time was that of the 17th to 18th when temperature did not fall below 61° F. or 62° F. at quite a number of places. At ordinary levels there were no very cold nights, but at high-level stations some rather low temperatures were recorded—namely, 34° F. at Dalwhinnie and Braemar and 35° F. at Balmoral on the 11th.

With a few exceptions, confined mainly to the Moray Firth, Orkney and Shetland, and a corner of Berwickshire, rainfall exceeded the normal, and in some cases amounted to 190 per cent of normal. As the result mainly of excessive falls on the 4th and 7th the total at Edinburgh was raised to 5·37 inches, of which by far the greater part fell in the week from the 3rd to the 9th. This total made the month in Edinburgh the wettest July since 1888, and it has been exceeded only on seven occasions in July in the last 165 years. It may be of interest to remark that the year 1830, which was characterised by the heaviest July rainfall ever recorded in this long period, was marked also by a very *outstanding autumn drought*; the same curious combination of opposite features occurred in 1937.

Sunshine totals all over Scotland were below normal, though fine periods just after the middle and at the end of the month saved the position in some cases from being exceptionally bad. Great deficiencies occurred, however, in the far north, Lerwick having a total sunshine for the month of only 66 hours and Baltasound a total of only 82 hours.

Thunder occurred widely on the 3rd and 4th, rather widely on the 7th and 9th, and sporadically on eight other days.

AUGUST.

Fine weather prevailed for the greater part of August, except between 4th and 7th and between 12th and 18th.

Mean temperatures were without exception above normal, and in the south-west by as much as two and a half degrees. The period of greatest heat for the year was from 31st July to 2nd August. On 1st August temperature reached or exceeded 80° F. in places in the west and south, and exceeded 70° F. everywhere except in the extreme north and north-west. The highest temperatures recorded were 84° F. at Ruthwell and 81° F. at Dumfries and Kilmarnock; and on the 2nd again 81° F. occurred at Kilmarnock. On the nights of 12th and 13th temperature did not fall below 60° at a number of places in the south-west. The lowest temperatures recorded were 34° F. at Wolfelee and Logie Coldstone on the 27th.

In some parts of Inverness-shire and Ross the total rainfall amounted to scarcely half the August average, and over the greater part of Scotland the fall was below average. Owing, however, to torrential rain accompanying thunderstorms on the 13th the precipitation along the shores of the Moray Firth and at Montrose amounted to double the average. Of the outstanding falls on the 13th special mention may be made of 3·39 inches at Montrose, 3·[illegible] inches at Inverness, and 3·13 inches at Nairn. The 14th was also a very wet day at some places.

During the very warm weather at the beginning of the month there was widespread sea fog along the east coast.

SEPTEMBER.

Though this was not the case in every district, a large part of Scotland had less rain and more sunshine and warmth than are usual in September. In the west and north strong winds or gales occurred between the 5th and the 8th.

The mean temperature was in most cases above the average for the month, generally by from half a degree to a degree, but though the general level of temperature was fairly high there was at no time any excessive heat. The highest temperatures reached were 71° F. at Edinburgh and Dunbar, and 70° F. at a number of places around the 27th. Rather low night temperatures for the season were recorded near the middle of the month, the lowest in the screen being 27° F. at Dalwhinnie on the 18th and 28° F. at Logie Coldstone, Braemar and Balmoral on the 16th. On the exposed ground at Dalwhinnie on the 18th temperature went down to 20° F. At high-level stations ground frost occurred on from five to seven nights.

Rainfall was ample over the higher ground in the west, but it was well below normal over almost all the eastern part of the country and also in the south-west. Most of the rain occurred in the first half of the month or in the last two days, there being some particularly heavy falls in the north and west on the 4th, 7th, and 30th.

Except for small deficiencies in the north-west and in the south-east corner of the country the aggregates of bright sunshine exceeded the normal by amounts of the order of thirty hours. At places on the Angus coast the month was the sunniest September since 1924, and at Aberdeen the sunniest since 1919.

OCTOBER.

A large part of the month of October was mild, calm, dry, and somewhat dull, but the last week was cooler and less settled. A complex and intense depression between the 22nd and 26th caused some severe gales, but these affected chiefly the South of England rather than Scotland.

Temperature in the mean over Scotland was about a degree above the October normal, but in Orkney the deviation from normal reached four degrees. The warmest time was around the 19th with 67° F. at Edinburgh and 66° F. at Banff. In the cold period from the 25th to the 28th, during a spell of northerly winds, day temperatures were commonly only from 44° F. to 48° F., with night temperatures going down to around freezing point and considerably lower at high-level stations. The lowest recorded was 19° F. at Braemar, which is also the lowest reported in October for some years, with 20° F. at Dalwhinnie and 21° F. at Logie Coldstone, all on the 28th. Ground frosts were quite frequent, and at Dalwhinnie a temperature of 11° F. on the exposed ground was registered on the 28th.

There was a narrow region of excessive rainfall, as compared with normal, extending in a line from Aberdeen to Dumfries, and in a few places to the westward of this line there was also an excess; but precipitation was for the most part deficient, and in some cases in the West Highlands the deficiency amounted to 50 per cent. The month would have been an unusually dry one but for rather heavy falls of rain around the 1st and from the 23rd to 28th. Snow fell on the mountains in the north and west on the 21st and on several other days up to the 28th.

Sunshine totals were below the October normal everywhere, except along the line of the Great Glen and the head of the Moray Firth, where they exceeded the average. The greatest deficiency was about an hour per day along the east coast from Angus to Berwick and across the industrial belt to Glasgow.

The quiet conditions during a large part of the month resulted in a good deal of fog in urban areas, though it was not of the dense type.

NOVEMBER.

November was an exceptionally dry month all over Scotland, and in many places was the driest November on record.

Though on the whole the days were rather warmer and the nights rather cooler than usual, the general level of temperature differed little from normal, but was just slightly above. This made the month the eighth in succession with a mean temperature more or less above normal. The highest temperatures were in the early part of the month—namely, 61° F. at Edinburgh on the 2nd, and at Achnashellach on the 2nd and 3rd. Another mild spell came at the end of the month. The coldest time was from the 13th to the 28th, the lowest temperature recorded in the screen being 15° F. at Braemar on the 23rd and 24th. Ground frost occurred with great frequency—on as many as twenty nights at many inland stations. Some very low temperatures were recorded on the exposed ground, in particular 10° F. at Dalwhinnie and 12° F. at Dunfermline and Stirling on the 24th, and 12° F. at Glenbranter on the 22nd.

Very many places had less than 25 per cent of the normal rainfall and few places received 50 per cent. The principal towns in Scotland have an average fall of 3·45 inches in November, but in 1937 the fall amounted to only 0·66 inches. At Falkirk the total was the lowest since records began in 1883, and at Paisley the lowest since 1884. At Tulliallan Castle the monthly total amounted to only 0·51 inches, and at Edinburgh, where records go back about 165 years, there has been no previous November with so low an amount as the 1937 one of 0·24 inches. On high ground, between the 9th and the 14th, there were appreciable falls of snow.

Sunshine records were not unusual, the eastern and north-eastern parts of the country had definitely less than the November normal, the western and south-western parts rather more than normal.

Around the 22nd to 24th fog lay over the central part of the country, especially the industrial belt from the Clyde area to South Fife.

DECEMBER.

Outstanding features of December were the unusually low temperatures and the heavy and widespread snowfalls of the second and third weeks.

The mean temperature for Scotland as a whole was some four degrees below the normal and equalled that of the very cold December of 1927. In Orkney and Shetland weather was relatively less cold, but at high-level stations such as Balmoral and Braemar the mean temperatures were about six degrees below their respective normals. In a relatively mild spell from the 22nd to the 27th 56° F. was reached at some stations in the north. The lowest temperatures occurred on the 13th—namely, —7° F. at Braemar, —5° F. at Logie Coldstone, —3° F. at Balmoral, and 0° F. at Dalwhinnie. The first of these readings (which means 39 "degrees of frost") was the lowest recorded in a standard screen anywhere in Scotland since 14th November 1919, when Braemar recorded —10° F.

The total precipitation was below normal, except in eastern districts; and over the country as a whole this was the fifth successive month with a deficiency. In the Western Highlands some places had less than a quarter of their normal rainfall. Eastern districts south of the Moray Firth had more than the average, and in the south-eastern counties there was about double the average. Heavy snowstorms swept the country between the 8th and the 15th, disorganising telegraph services and road traffic. At Balmoral on the 15th the undrifted depth of snow was 18 inches, and some Highland roads remained blocked until the end of the month.

Some stations in the west enjoyed considerable amounts of bright sunshine, but over Scotland as a whole the total duration approximated closely to the normal.

GENERAL NOTES.

The most notable features of the weather of the year 1937 were: (1) abnormally heavy rain in January over a large part of the country and especially in Deeside; (2) exceptional deficiency of rain over the north-western part of the country in the last quarter of the year; (3) exceptional cold, unequalled since 1919, in March and December, with comparatively warm conditions in almost every intervening month. Taking the country as a whole the aggregate rainfall for the year was about 10 per cent below normal, and the sunshine aggregates were also below normal over almost the whole of Scotland.

RAINFALL RECORDS FOR 1937, IN INCHES.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Shetland—Lerwick	5·57	4·00	2·73	1·68	2·17	4·63	1·91	1·87	2·65	3·61	2·48	3·76	37·31
Orkney—Kirkwall	4·89	4·08	2·18	·81	·37	2·46	1·92	2·20	3·37	3·23	2·19	2·15	29·85
Caithness—Wick	3·90	3·47	1·96	1·15	·69	2·77	1·96	3·09	1·75	2·51	1·46	2·20	26·91
Sutherland—Melvich	4·82	4·35	2·31	·44	1·07	2·96	3·36	2·14	2·12	2·08	2·01	1·81	29·42
Lairg	5·51	5·35	2·82	·33	1·64	2·27	3·37	2·25	2·06	2·19	·91	1·94	30·64
Ross and Cromarty—													
Fortrose	2·71	2·96	1·50	·35	1·49	1·81	2·67	3·99	1·20	1·75	·35	·96	21·74
Tain	2·41	3·69	2·28	·55	1·77	2·14	2·60	3·18	1·37	2·24	·64	1·01	23·88
Lochcarron	7·97	6·51	2·08	1·80	2·52	4·44	4·72	3·58	6·65	3·94	2·71	1·60	48·52
Stornoway	4·79	4·16	1·96	1·78	2·65	3·43	1·60	4·05	4·41	2·32	2·23	2·40	35·78
Inverness—													
Inverness	3·59	2·34	1·61	·32	1·25	1·52	2·58	5·67	1·62	2·17	·57	·97	24·21
Fort-William	12·83	6·46	1·20	2·22	3·18	4·92	6·38	4·56	9·33	2·88	1·06	3·54	58·51
Glenquoich	15·52	9·49	2·80	2·94	3·78	6·25	6·31	4·25	9·63	4·26	2·71	4·07	71·96
Portree	8·31	5·96	2·94	2·19	3·15	4·00	3·97	4·26	6·76	4·08	2·45	3·43	51·50
Nairn—Nairn	2·61	1·83	1·39	·60	1·19	1·83	3·15	5·43	1·13	2·32	·62	1·56	23·66
Moray—Gordon Castle	3·78	3·25	2·72	·45	1·81	2·26	3·07	2·60	1·09	2·32	1·73	2·81	27·92
Grantown	3·82	2·45	2·61	1·21	1·15	1·55	2·48	2·20	1·11	2·08	1·11	3·40	25·17
Banff—Banff	5·35	3·23	2·19	·53	1·08	1·36	3·45	2·23	·90	2·08	1·60	3·14	27·17
Aberdeen—Peterhead	4·48	3·82	2·89	1·03	1·22	1·62	3·02	2·01	1·53	3·29	2·02	4·74	31·67
Aberdeen (King's Coll.)	4·96	2·32	2·70	1·05	1·52	1·26	3·93	2·71	1·53	3·37	1·65	4·31	31·31
Balmoral	11·80	3·01	5·31	·96	1·73	·73	3·32	1·74	·99	3·05	·79	3·64	37·07
Kincardine—Fordoun	6·81	3·37	4·13	2·02	2·03	1·76	3·15	3·48	1·13	3·20	·97	5·64	37·69
Angus—													
Montrose (Asylum)	4·15	2·57	2·58	1·93	2·11	1·95	3·90	5·44	1·31	3·19	·67	4·12	33·92
Dundee	3·50	2·98	3·52	2·01	2·41	2·49	5·21	3·25	1·14	2·97	·57	3·57	33·62
Glamis Castle	7·51	3·78	3·35	1·84	2·33	1·78	4·31	3·74	1·78	3·97	·63	3·27	38·29
Brechin	6·11	3·12	2·95	2·25	2·00	2·17	2·90	3·23	1·25	3·00	·49	3·35	32·82
Perth—Blair Castle	8·72	3·05	1·72	·67	2·68	1·41	4·24	2·76	2·36	2·62	·61	1·66	32·50
Crieff	4·63	3·52	2·68	2·15	2·96	2·00	4·39	4·05	2·66	3·62	·39	2·65	35·70
Perth	3·49	2·94	3·12	1·57	2·14	1·54	3·91	3·94	1·22	3·57	·46	2·85	30·75
Fife—Cupar	2·85	3·45	2·77	1·23	2·17	2·29	3·98	4·38	1·15	2·83	·28	3·60	30·98
Kirkcaldy	2·61	3·58	2·34	1·43	2·57	1·23	4·28	5·67	1·47	3·54	·35	3·22	32·29
Kinross—Loch Leven	3·77	3·95	2·66	1·73	1·81	2·42	4·72	5·50	1·56	3·37	·48	3·12	35·09
Clackmannan—													
Tillicoultry	4·18	4·41	2·89	1·74	2·34	2·38	3·15	3·89	2·14	2·95	·56	3·36	33·99
Argyll—Gruline (Mull)	11·90	6·54	2·60	4·21	3·70	4·13	6·22	5·09	8·12	4·98	2·81	4·87	65·17
Oban	8·65	4·47	·39	1·72	2·36	4·12	7·15	3·69	6·25	3·79	1·97	2·20	46·76
Glencoe Gardens	14·81	7·47	1·92	2·45	4·09	4·72	8·73	4·42	8·30	3·00	1·35	3·75	65·01
Inveraray	15·74	8·60	1·40	3·84	2·85	7·01	9·50	7·19	9·45	3·94	2·50	5·36	77·38
Campbeltown	7·24	6·08	3·67	3·83	1·74	2·98	5·48	4·56	3·29	4·57	2·01	3·87	49·32
Bute—Rothesay	6·73	5·56	2·16	3·16	1·75	4·53	4·94	4·24	3·34	3·12	1·53	3·33	44·39
Stirling—Stirling	3·70	4·16	2·10	2·02	1·55	1·78	3·34	3·99	2·39	3·92	·48	2·62	32·05
Dumbarton—Arrochar	18·14	9·29	2·77	4·21	3·05	5·63	7·55	5·36	6·86	3·49	1·76	4·40	72·51
Helensburgh	9·03	6·78	2·35	2·71	1·59	4·30	3·98	4·22	3·29	3·17	1·13	3·44	45·99
Renfrew—Greenock	9·39	5·86	1·65	2·81	1·74	2·96	4·15	3·69	4·48	2·84	1·76	4·15	45·48
Paisley	4·34	5·05	1·60	1·90	1·52	1·84	3·62	3·52	3·60	3·52	·64	2·83	33·98
Ayr—Kilmarnock	4·55	4·76	·86	1·71	1·53	3·25	5·03	3·34	2·55	2·81	·61	2·67	33·67
Ayr	3·97	4·08	·78	1·60	1·17	2·22	4·73	2·63	2·27	3·88	·34	1·77	29·44
Muirkirk	6·61	4·75	1·01	2·73	1·47	3·03	4·86	4·05	2·42	4·01	1·24	2·17	38·35
Pinmore	7·79	6·10	2·27	3·35	1·61	3·16	3·74	3·80	2·88	3·99	·73	3·35	42·77
Lanark—													
Glasgow (Botanic Gdns.)	3·64	5·00	1·40	1·82	1·80	2·40	2·81	3·36	2·42	3·63	·35	2·19	30·82
Lesmahagow	5·19	4·09	1·43	1·51	1·47	2·05	3·87	3·92	2·48	4·38	·81	2·06	33·26
Biggar	4·56	3·63	1·59	1·11	1·58	1·80	4·88	4·49	1·92	4·00	·64	2·04	33·09
Linlithgow—													
Houston House	3·58	3·81	1·90	1·23	2·08	1·37	3·42	4·94	2·59	4·33	·54	2·32	32·11
Midlothian—													
Edinburgh (University)	2·43	3·19	1·97	·96	2·47	·94	5·63	4·26	1·59	3·98	·23	2·57	30·22
Gorebridge	2·74	3·75	2·53	1·17	3·13	·88	5·08	3·05	1·99	3·69	·66	5·01	33·68
Oxenfoord Castle	3·43	3·68	3·63	·95	2·96	1·05	4·25	3·39	2·53	3·63	·65	4·38	34·68
Haddington—													
North Berwick	2·48	2·55	2·97	·99	2·88	1·95	2·89	2·66	1·36	2·12	1·05	3·71	27·61
Stobshiels Reservoir	3·07	3·62	3·52	·83	3·26	1·13	3·92	4·17	1·83	3·52	·92	6·38	36·17
Berwick—Duns Castle	3·20	3·83	4·30	1·59	3·50	1·55	2·62	3·88	1·60	2·97	·92	6·72	36·68
Marchmont	3·11	3·73	3·76	1·42	3·68	1·45	2·65	2·87	1·52	3·55	·70	5·95	34·39
Peebles—West Linton	5·05	4·93	2·44	1·40	2·42	2·22	4·48	4·52	2·43	3·92	·70	5·06	39·57
Selkirk—Whitmuir Hall	3·64	3·37	2·86	1·67	4·29	1·71	3·65	3·80	2·34	3·52	·69	4·79	36·33
Roxburgh—													
Kelso (Broomlands)	2·21	2·68	2·52	·95	3·14	1·60	3·67	2·37	2·18	3·12	·36	3·54	28·34
Wolfelee	4·61	4·90	2·72	1·79	3·60	1·24	3·80	2·91	2·38	3·12	·76	4·12	35·95
Dumfries—Dumfries	4·59	4·45	1·68	3·28	1·68	2·56	3·13	2·25	2·60	4·75	·98	2·55	34·50
Moniaive	9·22	7·36	2·46	3·69	2·33	3·31	4·90	2·89	2·69	5·02	1·37	3·95	49·19
Langholm	7·13	5·79	2·90	2·71	3·12	3·36	4·80	2·49	4·76	2·57	1·30	4·30	45·23
Eskdalemuir	9·14	6·48	3·21	2·90	2·59	3·94	4·48	3·85	4·80	3·87	1·19	4·79	51·24
Kirkcudbright—													
Dalbeattie (Drumstinchall)	4·30	5·34	2·28	3·98	1·45	4·76	5·22	3·23	3·96	5·76	2·46	4·06	46·80
Carsphairn (Shiel)	11·53	6·59	2·76	3·72	3·48	2·72	4·56	3·39	4·22	5·11	·99	3·11	52·18
Auchencairn	4·23	6·44	2·25	4·14	1·55	3·40	5·51	2·99	4·03	4·43	1·66	4·11	44·74
Wigtown—Monreith	3·35	6·04	1·43	2·76	2·14	2·98	5·56	2·28	2·85	2·89	1·68	5·36	38·73

AGRICULTURAL STATISTICS.—Returned upon 4th June 1936—(*Compiled from Government Returns*).

Table No. 1.—Acreage under Crops and Grass in each County of Scotland.

Counties	Total Acreage under Crops and Grass.	Arable Land.	Permanent Grass.	Corn Crops.								Potatoes.	Turnips and Swedes.	Mangolds.	Sugar Beet.	Cabbage.	Rape.	Vetches or Tares for Seed.	Vetches, Tares, Mashlum, &c., for Fodder	Small Fruit.	Rye-grass and other Rotation Grasses and Clover.	Other Crops.	Bare Fallow.
				Wheat.	Barley, including Bere.	Oats.	Mixed Grain.	Rye.	Beans.	Peas.	Total Corn Crops.												
	Acres.	Acres.	Acres	Acres	Acres.	Acres.	Acres.	Acres	Acres	Acres	Acres	Acres.	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres.	Acres.
1. Aberdeen	619,533	561,376	58,157	182	6,475	178,648	12	28	78	139	185,562	7,085	76,677	22	1	256	870	7	1,237	178	288,660	798	578
2. Angus	242,364	209,874	32,490	17,425	5,095	53,844	24	74	73	49	76,584	15,917	26,271	37	879	484	256	1	376	2,271	33,096	540	162
3. Argyll	109,941	45,252	64,689	6	462	13,299	78	308	1	1	14,155	1,885	4,110	14	..	42	298	..	78	11	23,694	66	899
4. Ayr	302,267	117,741	184,526	1,688	19	31,993	24	19	144	22	33,908	7,580	6,287	302	4	216	657	3	368	143	67,735	399	189
5. Banff	154,881	138,777	16,104	85	5,216	43,080	8	2	18	27	48,436	1,520	17,640	4	7	18	72	35	330	16	70,507	82	160
6. Berwick	186,858	119,759	67,099	7,701	7,801	20,519	48	..	145	1	36,215	2,172	15,816	515	499	102	1,174	..	227	35	62,538	406	60
7. Bute	25,710	14,625	11,085	..	2	3,948	..	9	..	2	3,961	901	1,128	9	..	10	47	..	2	7	8,404	37	119
8. Caithness	102,794	76,965	25,829	3	339	24,230	3	13	..	2	24,590	892	9,389	..	..	38	3	5	84	3	41,829	17	115
9. Clackmannan	14,896	7,343	7,553	269	19	2,532	25	.	157	..	3,002	339	680	2	..	10	73	..	40	63	8,067	2	65
10. Dumfries	240,132	114,706	125,426	582	32	31,185	48	13	..	4	31,864	2,517	13,247	308	19	111	554	10	51	62	65,668	203	92
11. Dunbarton	43,872	18,504	25,368	491	5	5,430	3	..	4	1	5,934	2,015	1,143	12	5	36	189	..	53	100	8,820	117	80
12. East Lothian	107,751	77,811	29,940	7,659	12,293	11,167	12	..	7	309	31,447	7,844	9,698	913	501	960	356	16	160	343	23,835	1,287	446
13. Fife	231,318	149,088	82,230	17,445	6,417	36,667	71	189	207	30	61,026	15,883	16,729	81	3,491	300	686	7	517	423	49,143	632	670
14. Inverness	146,293	81,498	64,795	257	2,622	27,405	1,417	1,305	3	5	33,014	4,192	7,741	3	32	172	84	..	78	13	31,883	113	4,173
15. Kincardine	115,641	101,798	13,843	2,870	2,755	30,590	17	5	17	30	36,284	4,096	13,941	1	69	47	33	1	205	72	46,786	157	106
16. Kinross	31,931	18,377	13,554	666	60	5,688	..	4	4	..	6,422	1,185	2,012	3	1	21	179	1	16	24	8,408	61	44
17. Kirkcudbright	177,454	76,310	101,144	410	48	18,822	..	1	5	1	19,282	1,114	8,401	114	..	74	675	..	84	26	46,842	123	75
18. Lanark	233,571	111,930	121,641	2,576	37	32,284	68	33	16	37	35,101	5,931	8,423	37	3	397	1,092	1	285	1,255	58,239	875	351
19. Mid-Lothian	113,257	66,431	46,826	6,248	2,625	16,454	91	..	4	68	25,490	5,522	7,415	180	82	423	527	..	170	174	25,807	618	78
20. Moray	96,318	85,215	11,098	3,015	6,296	21,765	84	105	22	8	31,305	1,557	12,004	24	450	50	73	..	222	33	39,208	186	103
21. Nairn	24,929	22,068	2,861	260	1,286	6,266	3	9	2	2	7,827	253	3,426	2	40	16	4	..	30	1	10,391	30	48
22. Orkney	109,223	90,127	19,096	..	2,139	29,180	6	6	..	5	31,336	1,678	11,615	..	..	18	..	2	76	..	45,303	12	87
23. Peebles	49,058	18,802	30,256	5	45	5,118	..	..	..	6	5,174	278	2,476	1	..	20	485	..	82	43	10,246	42	5
24. Perth	320,181	208,192	116,939	11,865	979	57,063	85	193	857	22	70,564	17,614	20,739	28	462	293	1,004	7	626	3,817	86,619	572	847
25. Renfrew	77,399	26,676	50,723	1,714	8	7,081	10	..	17	7	8,832	2,751	1,750	3	..	87	201	1	15	58	12,597	302	74
26. Ross & Cromarty	137,042	106,152	30,890	1,512	3,969	31,286	34	100	23	5	36,929	6,599	12,275	2	58	286	79	28	223	28	48,328	217	1,100
27. Roxburgh	175,149	103,903	71,246	4,020	3,568	19,584	65	3	25	10	27,275	1,408	13,704	209	91	47	584	5	178	46	60,089	207	60
28 Selkirk	30,790	13,801	16,989	3	18	3,456	..	.	..	.	3,477	120	1,812	3	..	6	122	..	20	6	8,215	20	..
29. Stirling	108,088	44,512	63,576	1,920	132	15,866	61	4	910	4	18,397	3,055	3,191	11	3	59	466	6	516	127	17,938	169	574
30. Sutherland	30,787	20,007	10,780	..	124	6,142	..	3	..	1	6,270	829	2,227	..	..	7	26	3	19	1	10,328	9	288
31. West Lothian	52,239	28,000	24,239	3,101	941	8,875	60	2	8	5	13,001	2,405	2,640	37	13	32	283	7	101	67	9,142	95	177
32. Wigtown	152,619	93,193	59,426	264	7	24,211	..	8	59	2	24,551	1,764	10,248	370	65	122	424	..	158	7	55,027	208	249
33 Zetland	28,146	12,182	15,964	..	410	5,603	.	1	..		6,014	1,756	1,016	.	.	627		..	5	..	2,209	18	587
Total	4,592 377	2,975,995	1,616,382	98,742	72,283	28,780	2,316	2,547	2,806	805	1,003,229	138,057	345,871	3,202	6,775	5,327	11,128	146	6,582	9,448	1,430,054	8,570	12,006

TABLE No. 2.—TOTAL PRODUCE OF WHEAT AND BARLEY, ACREAGE and YIELD per Acre in the Year 1936, compared with the YIELD for the Year 1935, and the AVERAGE of the Ten Years, 1926-1935, in each COUNTY of SCOTLAND.

COUNTIES.	WHEAT.					BARLEY, INCLUDING BERE.				
	Total Produce in 1936.	Acreage in 1936.	Yield per acre.		Average of the Ten Years 1926 1935.	Total Produce in 1936.	Acreage in 1936.	Yield per acre.		Average of the Ten Years, 1926 1935.
			1936.	1935.				1936.	1935.	
	Tons.	Acres.	Cwt.	Cwt.	Cwt.	Tons.	Acres.	Cwt.	Cwt.	Cwt.
Aberdeen	160	182	17.6	19.1	*17.9	5,500	6,475	17.1	17.9	16.8
Angus	15,000	17,425	17.7	22.5	20.5	4,700	5,095	15.5	21.0	18.2
Argyll	7	6	21.0	20.6	†19.1	260	462	11.3	18.2	14.8
Ayr	2,000	1,688	24.2	26.0	25.4	17	19	17.7	15.3	17.1
Banff	70	85	16.3	18.8	‡18.6	4,500	5,216	17.4	18.7	18.8
Berwick	8,300	7,701	21.6	22.4	21.5	7,600	7,801	19.6	21.5	17.6
Bute	..	..	..	21.5	‡21.2	..	2	..	16.9	*17.6
Caithness	4	3	27.7	27.1	..	270	339	15.7	15.5	16.4
Clackmannan	260	269	19.6	25.7	24.5	17	19	18.3	22.6	20.9
Dumfries	730	582	24.9	26.4	23.0	24	32	15.3	16.5	16.7
Dunbarton	440	491	17.9	20.5	21.4	4	5	15.2	16.3	*14.2
East Lothian	8,500	7,659	22.1	27.4	24.8	14,000	12,293	23.3	26.1	23.2
Fife	17,000	17,445	18.8	23.3	20.6	5,200	6,417	16.2	20.0	19.0
Inverness	270	257	21.3	22·9	20.9	1,700	2,622	12.8	13.7	13.1
Kincardine	3,000	2,870	21.0	23.5	21.5	2,200	2,755	15.9	16.6	16.8
Kinross	560	666	16.7	23.1	21.8	50	60	16.8	13.1	18.0
Kirkcudbright	440	410	21.5	19.0	20.1	40	43	18.4	18.4	16.9
Lanark	2,400	2,576	18.8	20.0	19.9	27	37	14.9	15.9	15.6
Mid-Lothian	7,300	6,248	23.5	27.9	25.0	2,900	2,625	21.9	23.4	21.8
Moray	3,500	3,015	23.2	24.5	23.4	5,200	6,296	16.6	17.4	18.7
Nairn	250	260	19.1	19.4	..	920	1,285	14.3	14.6	14.6
Orkney	..	..	..	..	..	1,800	2,139	16.8	16.2	16.3
Peebles	5	5	21.0	24.5	†22.8	48	45	21.6	22.6	18.9
Perth	12,000	11,365	20.9	22.7	20.9	970	979	19.7	20.8	19.0
Renfrew	1,900	1,714	22.0	22.4	22.2	2	3	15.0	14.0	†16.3
Ross and Cromarty	1,800	1,512	23.2	23.2	22.8	3,100	3,969	15.6	16.1	15.4
Roxburgh	3,500	4,020	17.4	23.7	22.0	3,000	3,568	16.8	21.4	18.7
Selkirk	3	3	17.7	17.7	‡17.7	15	18	16.7	20.0	16.0
Stirling	1,900	1,920	20.3	25.1	19.8	160	132	23.3	20.0	17.2
Sutherland	..	..	..	17.4	..	100	124	16.0	15.7	17.5
West Lothian	3,200	3,101	20.4	26.9	24.8	1,100	941	23.3	24.8	22.9
Wigtown	260	264	19.8	25.0	§22.3	8	7	9.9	23.1	20.3
Zetland	..	..	..	..	..	280	410	13.9	14.4	14.8
Total all Scotland	94,759	93,742	20.2	23.8	21.8	65,707	72,283	18.3	19.8	18.4

* Average of 9 years only.
† Average of 7 years only.
‡ Average of 6 years only.
§ Average of 8 years only.

TABLE No. 3.—TOTAL PRODUCE OF OATS, ACREAGE and YIELD per Acre in the Year 1936, compared with the YIELD for the Year 1935, and the AVERAGE of the Ten Years, 1926-1935 in each COUNTY OF SCOTLAND.

COUNTIES.	OATS.				
	Total Produce in 1936.	Acreage in 1936.	Yield per acre.		Average of the Ten Years 1926-1935.
			1936.	1935.	
	Tons.	*Acres.*	*Cwt.*	*Cwt.*	*Cwt.*
Aberdeen	139,000	178,648	15·5	16·6	15·2
Angus	48,000	53,844	17·7	20·0	18·6
Argyll	9,400	13,299	14·2	14·1	13·7
Ayr	26,000	31,992	16·4	18·2	17·6
Banff	38,000	43,080	17·5	15·7	16·1
Berwick	15,000	20,519	14·4	16·6	14·9
Bute	2,800	3,948	13·9	15·7	14·9
Caithness	17,000	24,230	14·0	12·9	13·0
Clackmannan	2,300	2,532	18·4	19·3	18·8
Dumfries	28,000	31,185	18·0	18·0	15·8
Dunbarton	3,700	5,430	13.5	14·7	15·3
East Lothian	12,000	11,167	21·1	22·9	21·7
Fife	27,000	36,667	14·9	17·1	18·1
Inverness	16,000	27,405	11·7	12·0	10·7
Kincardine	24,000	30,590	15·9	16·3	17·5
Kinross	3,800	5,688	13·5	15·7	16·5
Kirkcudbright	12,000	18,822	13·1	13·6	13·0
Lanark	24,000	32,284	14·8	14·4	14·6
Mid-Lothian	17,000	16,454	21·1	22·4	20·2
Moray	18,000	21,765	16·1	16·6	16·6
Nairn	4,200	6,266	13·3	14·6	14·1
Orkney	18,000	29,180	12·3	13·6	13·5
Peebles	3,900	5,118	15·3	17·0	15·8
Perth	48,000	57,063	16·8	17·8	16·8
Renfrew	5,500	7,081	15·6	14·7	14·8
Ross and Cromarty	22,000	31,286	14·2	13·8	14·5
Roxburgh	13,000	19,584	13·2	14·7	15·2
Selkirk	1,900	3,456	10·8	12·2	12·7
Stirling	12,000	15,366	15·3	18·6	17·7
Sutherland	3,900	6,142	12·8	12·7	13·2
West Lothian	8,600	8,875	19·3	20·6	19·9
Wigtown	15,000	24,211	12·7	18·3	16·4
Zetland	3,100	5,603	11·1	10·9	10.2
Total all Scotland	642,100	828,780	15·5	16·5	15·8

Table No. 4.—Total Produce of Potatoes, Acreage and Yield per Acre in the Year 1936, compared with the Yield for Year 1935, and the Average of the Ten Years, 1926-1935, in each County of Scotland.

Counties.	Total Produce in 1936.	Acreage in 1936.	Yield per Acre.		Average of the Ten Years 1926-1935.
			1936.	1935.	
	Tons.	Acres.	Tons.	Tons.	Tons.
Aberdeen	51,000	7,035	7·2	7·2	6·4
Angus	135,000	18,917	7·1	6·8	6·6
Argyll	12,000	1,885	6·3	6·1	5·6
Ayr	54,000	7,530	7·2	6·5	8·2
Banff	8,900	1,520	5·9	6·3	6·0
Berwick	13,000	2,172	6·1	5·4	5·6
Bute	6,300	901	7·0	7·0	6·6
Caithness	5,000	892	5·6	6·1	6·3
Clackmannan	2,600	339	7·8	6·9	6·0
Dumfries	18,000	2,517	7·3	8·0	7·6
Dunbarton	16,000	2,015	7·8	7·2	7·3
East Lothian	68,000	7,844	8·6	7·8	7·5
Fife	150,000	15,383	9·7	6·9	7·3
Inverness	22,000	4,192	5·3	5·4	5·2
Kincardine	24,000	4,096	5·9	5·4	5·9
Kinross	9,800	1,185	8·3	7·9	6·4
Kirkcudbright	7,900	1,114	7·1	5·9	6·7
Lanark	44,000	5,931	7·4	6·9	6·9
Mid-Lothian	47,000	5,522	8·5	8·5	7·8
Moray	8,800	1,557	5·7	6·0	6·1
Nairn	1,100	253	4·5	4·5	4·7
Orkney	11,000	1,678	6·9	6·4	6·2
Peebles	1,900	278	6·8	7·5	7·5
Perth	121,000	17,614	6·9	6·2	6·3
Renfrew	27,000	2,751	9·6	7·7	8·3
Ross and Cromarty	46,000	6,599	7·0	6·0	6·3
Roxburgh	9,900	1,408	7·0	6·9	6·9
Selkirk	730	120	6·0	5·7	6·2
Stirling	23,000	3,055	7·6	7·5	7·9
Sutherland	4,700	829	5·6	4·7	5·8
West Lothian	20,000	2,405	8·4	8·2	7·9
Wigtown	11,000	1,764	6·3	6·7	7·3
Zetland	9,600	1,756	5·4	5·3	5·5
Total	990,230	133,057	7·4	6·7	6·8

TABLE No. 5.—TOTAL PRODUCE of TURNIPS, SWEDES, and MANGOLDS, ACREAGE and YIELD per Acre in the Year 1936, compared with the YIELD for the Year 1935, and the AVERAGE of the Ten Years, 1926-1935, in each COUNTY of SCOTLAND.

COUNTIES.	TURNIPS AND SWEDES.					MANGOLDS.				
	Total Produce in 1936.	Acreage in 1936.	Yield per Acre.		Average of the Ten Years, 1926-1935.	Total Produce in 1936.	Acreage in 1936.	Yield per Acre.		Average of the Ten Years, 1926-1935.
			1936.	1935.				1936.	1935.	
	Tons.	Acres.	Tons	Tons	Tons.	Tons.	Acres.	Tons.	Tons.	Tons.
Aberdeen	1,120,000	76,677	14.6	13.5	13.9	320	22	14.4	13.4	18.2*
Angus	602,000	26,271	22.9	21.6	17.2	610	37	16.6	20.2	17.6
Argyll	67,000	4,110	16.4	19.1	16.7	250	14	18.3	19.3	15.2
Ayr	110,000	6,287	17.5	14.9	19.0	7,500	302	24.7	22.9	22.2
Banff	301,000	17,640	17.1	19.2	16.2	48	4	12.8	4.8	11.8†
Berwick	336,000	15,816	21.2	17.5	17.3	9,200	515	17.9	16.6	18.4
Bute	19,000	1,128	17.0	20.0	17.0	190	9	20.0	20.0	18.4*
Caithness	198,000	9,389	21.1	21.1	19.2	..	..	..	..	..
Clackmannan	16,000	680	23.1	21.7	14.3	45	2	20.0	..	..
Dumfries	184,000	13,247	13.9	14.7	17.4	6,100	308	19.8	18.1	17.0
Dunbarton	21,000	1,143	18.1	15.2	16.9	380	12	30.7	26.0	20.5
East Lothian	205,000	9,698	21.1	18.0	18.2	23,500	913	25.7	24.5	21.8
Fife	305,000	16,729	18.2	15.8	15.5	1,500	81	19.0	18.0	18.4
Inverness	96,000	7,741	12.5	11.5	12.4	45	3	15.0	11.2	..
Kincardine	233,000	13,941	16.7	16.2	18.3	11	1	11.0	10.0	..
Kinross	36,000	2,012	18.1	22.6	14.6	50	3	17.0	..	..
Kirkcudbright	123,000	8,401	14.6	9.6	14.1	2,300	114	19.9	15.0	15.9
Lanark	162,000	8,423	19.3	19.5	18.7	650	37	17.5	18.5	19.7
Mid-Lothian	150,000	7,415	20·2	17.9	17.7	3,400	130	26.5	23.8	21.9
Moray	227,000	12,004	18.9	16.4	16.9	520	24	22.0	18.8	18.4
Nairn	39,000	3,426	11.3	11.0	12.1	26	2	13.0	10.0	..
Orkney	128,000	11,615	11.1	11.6	11.6	..	..	..	..	..
Peebles	47,000	2,476	18.9	19.2	18.1	25	1	20.0	..	..
Perth	403,000	20,739	19.4	18.9	17.1	460	28	16.4	17.1	15.7
Renfrew	34,000	1,750	19.2	18.5	18.2	160	8	20.0	19.2	19.8
Ross and Cromarty	196,000	12,275	15.9	15.5	15.4	30	2	15.0	14.0	13.8
Roxburgh	233,000	13,704	17.0	15.9	14.8	5,500	209	26.2	26.4	17.7
Selkirk	26,000	1,812	14.1	14.0	14.3	75	3	25.0	21.1	17.1*
Stirling	57,000	3,191	18.0	18.3	18.9	140	11	12.8	12.6	17.1*
Sutherland	36,000	2,227	16.0	17.3	15.5	..	..	..	..	..
West Lothian	50,000	2,640	18.9	19.1	18.4	850	37	23.2	28.0	21.6
Wigtown	153,000	10,248	15.0	15.0	16.6	7,200	370	19.4	20.4	18.9
Zetland	15,000	1,016	14.6	13.9	12.5	..	..	..	..	..
Total	5,928,000	345,871	17.1	16.2	15.9	71,085	3,202	22.2	21.1	19.9

* Average of 9 years only. † Average of 6 years only

TABLE No. 6.—TOTAL PRODUCE OF HAY from Rye-Grass and other Rotation Grasses and Clover, also Total from Permanent Grass, ACREAGE, and YIELD per Acre in the Year 1936, compared with the YIELD for the Year 1935, and the AVERAGE of the Ten Years, 1926-1935, in each COUNTY of SCOTLAND.

COUNTIES.	FROM RYE-GRASS AND OTHER ROTATION GRASSES AND CLOVER.					FROM PERMANENT GRASS. (Including Timothy.)				
	Total Produce in 1936.	Acreage in 1936.	Yield per Acre.		Average of the Ten Years, 1926-1935.	Total Produce in 1936.	Acreage in 1936.	Yield per Acre.		Average of the Ten Years, 1926-1935.
			1936.	1935.				1936.	1935.	
	Tons.	Acres.	Cwt.	Cwt.	Cwt.	Tons.	Acres.	Cwt.	Cwt.	Cwt.
Aberdeen . .	62,000	55,323	22.3	31.2	26.4	2,000	2,312	17.6	22.6	20.6
Angus . . .	29,000	20,776	27.8	43.0	38.7	2,100	1,746	23.4	35.8	31.3
Argyll . . .	14,000	10,457	27.0	25.5	30.2	17,000	15,018	22.9	21.5	27.0
Ayr . . .	39,000	25,868	30.0	30.7	32.0	45,000	22,645	39.7	40.5	42.1
Banff . . .	16,000	11,405	28.7	33.2	29.8	610	629	19.5	21.0	21.5
Berwick . . .	22,000	13,735	31.9	39.7	34.5	5,100	3,427	29.6	32.0	28.7
Bute . . .	3,700	2,270	32.6	33.3	34.7	880	534	33.0	33.9	33.4
Caithness . .	9,200	9,945	18.5	21.5	19.2	540	1,218	8.9	7.8	8.2
Clackmannan . .	2,100	1,159	36.1	55.4	49.4	2,400	1,036	45.4	58.0	51.8
Dumfries . .	31,000	20,448	30.3	33.1	33.2	22,000	19,254	23.1	25.1	28.6
Dunbarton . .	7,900	4,687	33.7	35.8	38.7	3,700	2,264	33.0	34.3	37.0
East Lothian . .	16,000	7,759	42.4	50.9	49.6	1,750	1,216	28.1	34.4	31.7
Fife . . .	41,000	23,000	35.6	48.3	45.8	5,100	3,504	29.4	39.5	36.9
Inverness . .	12,000	11,731	20.6	20.8	21.8	8,400	10,560	15.9	18.9	17.2
Kincardine . .	16,000	11,771	27.3	33.1	32.2	740	624	23.9	29.6	25.4
Kinross . . .	3,300	2,748	24.1	45.1	44.7	480	445	21.5	39.1	35.6
Kirkcudbright .	14,000	10,955	25.3	24.8	27.2	17,000	11,889	27.7	26.1	36.4
Lanark . . .	49,000	28,682	34.4	36.9	35.8	22,000	14,017	31.8	33.0	33.4
Mid-Lothian . .	20,000	9,856	40.5	50.4	48.8	2,600	1,640	31.6	32.1	34.7
Moray . . .	8,500	6,245	27.2	33.2	25.8	300	279	21.0	23.6	19.3
Nairn . . .	1,500	1,640	18.8	21.1	20.6	85	129	13.1	14.3	15.0
Orkney . . .	21,000	11,032	38.2	49.8	37.9	1,100	1,279	17.2	20.7	15.9
Peebles . . .	3,100	2,457	25.0	40.8	35.8	2,400	1,704	27.9	33.9	30.4
Perth . . .	40,000	30,707	26.2	31.9	30.2	15,000	11,793	26.1	27.9	29.3
Renfrew . . .	16,000	7,205	44.2	42.5	42.8	14,000	6,200	46.1	43.5	44.6
Ross and Cromarty	11,000	12,665	17.3	20.9	20.7	3,500	4,479	15.4	16.0	16.4
Roxburgh . .	13,000	10,654	24.4	31.0	32.2	7,250	7,766	18.6	25.4	28.3
Selkirk . . .	1,300	1,426	18.1	25.2	31.1	2,100	2,302	18.2	21.3	29.6
Stirling . . .	16,000	9,204	34.7	36.6	40.2	18,000	8,646	40.9	44.1	46.5
Sutherland . .	3,800	4,597	16.7	19.6	19.4	1,200	1,688	14.4	16.6	16.7
West Lothian .	11,000	5,777	37.0	51.7	48.5	3,200	1,800	35.8	41.4	41.7
Wigtown . .	22,000	8,846	48.7	24.1	30.2	13,000	6,065	44.7	28.1	30.4
Zetland . . .	2,600	1,713	30.0	33.7	30.3	2,000	2,229	17.7	17.7	19.0
Total . .	573,000	396,679	29.1	34.6	32.2	242,585	170,822	28.6	29.3	31.3

TABLE No. 7.—HAY from Permanent Grass:—TOTAL PRODUCE, ACREAGE, and YIELD PER ACRE, in 1936, in each COUNTY OF SCOTLAND, compared with the YIELD for 1935, and the AVERAGE of the Ten Years, 1926-1935.

COUNTIES.	HAY FROM TIMOTHY MEADOWS. (Also included with Permanent Grass.)				
	Total Produce in 1936.	Acreage in 1936.	Yield per acre.		Average of the Ten Years, 1926-1935.
			1936.	1935.	
	Tons.	*Acres.*	*Cwt.*	*Cwt.*	*Cwt.*
Aberdeen	110	88	24.5	31·1	32.7
Angus	670	422	31.9	45·6	41.3
Argyll	900	573	31.4	30·5	34.0
Ayr	29,000	12,796	45.7	46·2	47.6
Banff	..	..	..	35·6	..
Berwick	390	262	30.1	31·1	28.0
Bute	150	91	33.4	35·8	34.9
Caithness	9	12	15.0	5.0	..
Clackmannan	2,200	888	48.6	59·1	54·6
Dumfries	6,900	4,920	27.9	31·0	31.5
Dunbarton	1,600	787	40.9	43·6	47.0
East Lothian	330	166	39.2	47·0	52.6
Fife	2,700	1,474	36.7	50.5	49.5
Inverness	26	28	18.8	..	..
Kincardine	160	95	34,5	40·0	43.3*
Kinross	240	225	21.5	40·0	41.2
Kirkcudbright	4,600	2,756	33.2	34·6	35.4
Lanark	14,000	7,344	37.9	39·5	39.2
Mid-Lothian	1,400	648	42.4	51·3	50.0
Moray	6	3	40.0	50·0	..
Nairn	..	..	..	..	..
Orkney	..	..	..	..	..
Peebles	670	361	37.2	45·3	41.5
Perth	6,500	3,692	35.4	37·1	43.1
Renfrew	9,100	3,580	50.7	45·0	47.7
Ross and Cromarty	75	80	18.7	21·7	23.2†
Roxburgh	640	491	26.2	31·9	32.5
Selkirk	350	301	23.2	28·8	32.4
Stirling	13,000	5,616	46.8	50·4	54.8
Sutherland	..	..	..	..	..
West Lothian	1,700	708	47.6	53·9	51.3
Wigtown	3,300	1,333	50.1	37·1	38.5
Zetland	..	..	..	..	..
Total all Scotland	100,726	49,740	40.6	42.3	44.4

* Average of 6 years only. † Average of 8 years only.

TABLE No. 8.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS IN EACH COUNTY OF SCOTLAND AS RETURNED ON 4TH JUNE 1936.

COUNTIES.	HORSES (including Ponies).					CATTLE.							SHEEP.				PIGS.		
	Used solely for Agriculture, &c.*	Stallions.†	Unbroken Horses.		Other Horses.	Cows in Milk.	Cows in Calf, but not in Milk.	Heifers in Calf.	Bulls used for Service.	Other Cattle.			Ewes kept for Breeding.	Rams to be used for Service.	Other Sheep.		Sows kept for Breeding.	Boars used for Service.	Other Pigs.
			1 Year & above.	Under 1 Year.						2 Years & above.	1 Year & under 2 Years.	Under 1 Year.			1 Year and above.	Under 1 Year.			
1. Aberdeen	17,025	60	3,096	1,257	2,278	36,028	4,231	2,875	1,497	39,422	60,021	38,107	153,155	4,812	32,599	195,703	3,645	321	20,098
2. Angus	6,867	9	394	157	842	9,874	1,227	877	451	17,606	14,198	8,894	85,211	3,058	17,228	94,849	2,005	150	11,938
3. Argyll	3,151	17	546	217	320	15,364	2,325	2,041	787	6,043	10,105	11,935	329,624	10,127	39,217	238,178	436	56	3,600
4. Ayr	5,891	48	797	379	784	45,488	7,929	15,800	2,254	8,603	24,115	24,274	189,008	4,950	41,731	181,856	1,637	155	13,136
5. Banff	4,874	20	1,003	431	705	10,275	1,199	702	433	5,481	14,054	11,820	46,740	1,512	12,868	55,690	971	96	5,517
6. Berwick	2,819	12	817	105	449	5,883	781	802	383	6,080	9,103	6,291	145,478	3,880	40,852	200,618	990	122	6,004
7. Bute	731	6	145	58	96	2,556	382	760	160	1,182	2,295	2,179	20,716	635	6,142	16,700	70	9	502
8. Caithness	3,288	11	676	281	333	6,458	690	410	180	1,001	5,710	6,547	89,054	2,583	23,616	105,110	241	27	1,466
9. Clackmannan	322	2	71	24	87	1,225	219	246	58	944	1,179	643	6,575	274	1,389	6,790	122	20	521
10. Dumfries	4,215	17	309	328	616	22,847	3,202	7,802	1,280	9,354	19,018	16,958	264,095	7,245	68,118	262,644	1,822	142	10,504
11. Dunbarton	994	20	145	61	109	5,186	1,115	1,368	250	1,193	2,878	2,765	34,692	1,285	8,691	28,864	414	34	3,008
12. East Lothian	2,346	6	146	73	151	2,289	416	822	186	6,305	5,250	2,088	56,170	1,530	20,237	78,018	844	86	5,161
13. Fife	5,604	37	896	291	615	12,092	2,054	1,885	646	12,096	13,795	9,931	59,518	2,069	9,438	75,392	1,822	219	10,928
14. Inverness	4,681	18	441	196	405	16,381	2,447	1,203	573	2,918	7,636	11,592	225,655	6,826	64,695	163,568	303	58	3,082
15. Kincardine	2,995	3	377	104	278	5,797	657	328	235	6,894	9,549	5,866	30,752	876	2,818	36,491	587	50	4,214
16. Kinross	641	5	102	88	35	1,484	393	247	87	903	2,425	1,349	16,200	549	2,626	17,989	163	19	928
17. Kirkcudbright	2,818	14	577	206	308	18,256	1,758	6,780	991	8,220	15,718	12,776	171,949	4,777	41,330	171,760	1,278	157	12,324
18. Lanark	4,853	29	725	291	476	29,010	7,062	7,865	1,495	7,567	15,236	13,868	108,969	3,106	26,414	106,910	1,847	116	9,299
19. Mid-Lothian	2,194	4	192	53	327	6,763	964	997	238	3,764	4,336	2,661	75,266	1,888	24,175	89,746	2,075	184	16,562
20. Moray	2,819	13	482	203	231	5,789	622	397	247	3,239	8,326	5,553	19,548	557	3,738	20,446	695	54	5,404
21. Nairn	787	4	133	58	49	1,899	213	144	99	415	1,990	1,823	5,327	458	1,560	5,122	171	25	908
22. Orkney	4,422	19	781	405	615	10,192	1,247	801	250	4,299	11,536	10,936	28,338	807	7,008	38,660	270	36	2,029
23. Peebles	588	3	53	30	76	1,804	272	608	125	988	2,180	1,646	90,590	2,338	20,506	85,119	103	11	797
24. Perth	7,520	51	841	366	805	16,351	2,357	2,192	937	12,362	21,452	17,444	284,733	9,182	68,285	252,086	1,487	168	9,918
25. Renfrew	1,592	10	223	72	252	11,021	2,598	2,935	564	1,517	4,844	4,471	20,368	677	3,750	20,639	941	69	6,940
26. Ross & Cromarty	4,199	9	424	164	390	12,931	2,165	1,038	359	2,908	8,090	7,642	137,472	3,945	54,060	118,092	715	74	5,177
27. Roxburgh	2,487	14	288	83	588	6,390	1,030	1,014	383	5,995	7,213	7,029	227,390	6,111	69,802	272,459	481	57	3,281
28. Selkirk	418	1	42	7	95	1,390	235	288	70	523	1,066	963	87,038	2,017	20,592	78,317	86	10	524
29 Stirling	2,530	25	430	189	320	9,261	2,259	2,939	533	6,464	10,719	6,249	57,348	1,722	14,080	53,701	804	89	4,920
30. Sutherland	1,334	3	101	49	122	3,208	617	232	71	473	1,442	1,738	90,810	2,240	40,808	73,371	47	6	419
31. West Lothian	1,253	7	163	70	160	4,149	934	897	222	3,805	3,029	2,127	8,017	221	2,513	10,520	553	49	3,783
32. Wigtown	3,139	24	585	278	198	27,680	1,571	4,149	1,028	6,580	10,905	11,653	64,946	1,949	13,018	65,539	1,699	175	15,400
33. Zetland	1,492	8	111	88	1,018	3,847	716	289	55	909	2,129	2,111	79,573	2,592	28,404	57,640	8	1	90
Total	110,891	538	16,112	6,537	13,578	368,491	55,887	70,678	17,018	195,533	331,537	273,908	3,310,331	96,698	877,278	3,273,090	28,917	2,845	204,022

* Including Mares kept for breeding.

† Above two years old used, or intended to be used, for service.

TABLE No. 9.—QUANTITY AND VALUE OF CORN, &c., imported into the United Kingdom in the undermentioned Years.

[*From Trade and Navigation Returns.*]

	Quantities.			Values.		
	1935.	**1936.**	**1937.**	**1935.**	**1936.**	**1937.**
Wheat from—	Cwt.	Cwt.	Cwt.	£	£	£
British India	158,960	3,249,267	6,287,231	56,429	1,453,779	3,201,294
Australia	17,684,450	23,269,529	22,408,211	5,369,537	8,625,335	11,519,435
Canada	36,594,153	57,813,009	34,248,724	12,833,614	22,393,603	19,148,960
Other British Countries	42	44,974	587,771	21	11,157	200,133
Soviet Union	6,910,464	167,306	8,130,138	2,194,258	55,771	3,394,126
Germany	175,341	..	423,024	46,434	..	206,943
Roumania	1,836,918	4,422,427	2,271,830	479,809	1,624,440	1,028,467
United States of America	593,029	45,568	3,474,155	161,037	20,645	1,681,320
Argentine Republic	22,752,391	957,157	15,471,538	6,047,332	353,425	7,206,171
Other Foreign Countries	14,220,147	10,803,103	3,780,901	3,275,428	3,411,931	1,757,694
Total	101,225,904	100,772,480	96,883,528	30,463,890	37,950,086	49,844,543
Wheat products— Meal and flour from—						
Australia	1,805,657	2,469,558	3,313,629	662,141	1,061,191	1,996,143
Canada	4,225,592	4,108,987	4,043,724	2,015,243	2,132,623	2,861,296
Other British Countries	3,594	3,971	33,445	1,072	1,003	20,183
France	887,839	730,602	404,273	248,068	273,708	220,007
Italy	422,250	..	980	84,276	..	452
United States of America	89,528	77,586	107,607	48,805	49,605	75,306
Argentine Republic	202,451	272,383	409,920	50,802	86,618	161,765
Other Foreign Countries	344,55	8,436	227,814	108,959	238,604	114,845
Total	7,981,46	8,366,523	8,540,892	3,219,366	3,843,352	5,449,997
Barley	17,097,486	18,294,415	18,191,954	4,169,841	5,006,490	7,287,956
Oats	3,553,614	2,161,092	1,207,868	1,038,205	604,685	485,888
Peas, not fresh	1,601,599	1,981,708	1,484,082	902,937	1,050,047	1,005,396
Beans, not fresh	595,426	1,265,462	747,021	308,294	556,978	461,251
Maize	59,455,687	73,293,065	71,760,418	12,176,121	16,262,217	21,424,173
Maize products	4,762,584	2,570,605	5,069,007	1,531,822	1,145,547	2,144,689
Oat products	419,134	515,278	464,857	450,418	600,081	566,469
Rice	2,161,457	2,217,974	2,311,048	905,284	1,015,561	1,224,543
Other kinds of grain	986,945	666,554	489,155	295,392	193,338	189,699
Other products	983,025	887,566	505,852	728,860	696,753	675,679
Farinaceous substances not elsewhere specified and Malt	1,053,630	1,031,115	985,124	542,030	610,978	650,759
Total of corn, &c.	92,629,587	104,864,829	103,166,376	23,048,704	27,742,675	36,116,602
Total of Group	201,827,960	214,003,782	208,590,791	56,731,969	69,536,113	91,411,142

TABLE NO. 10.—SUMMARY OF TOTAL VALUES APPEARING IN TABLE NO. 9 OF GRAIN AND FLOUR imported into the United Kingdom for the years 1935, 1936 and 1937.

	1935.	1936.	1937.
From—	£	£	£
Union of South Africa	1,641,412	388,553	2,672,186
Southern Rhodesia	52,409	234,020	420,123
Kenya	14,326	200,275	69,471
British India	782,244	2,077,869	4,308,039
British Malaya	250,279	289,789	365,821
Australia	6,385,431	10,081,565	14,100,414
Canada	17,652,855	27,126,597	25,034.189
Other British Countries	151,085	148,761	200,923
Soviet Union	3,596,651	574,959	4,460,855
Denmark	93,114	213,515	866,181
Germany	177,986	236.388	237,015
Netherlands	659,598	644,253	921,324
Java	168,347	179,936	220,253
Belgium	560,885	802,248	1,019,353
France	2,185,214	1,782,914	488,064
Madagascar	108,587	194,392	158,005
Spain	70,656	26,704	36
Italy	122,385	27,010	24,549
Roumania	789,198	2,953,862	1,439,493
Iraq	394,574	846,707	2,066,556
Iran	42,843	85,882	68,037
Japan	394,367	305,229	316.372
United States of America	1,218,197	1,375,010	3,379,583
Chile	101,527	233,296	243,077
Argentine Republic	17,254,419	15,375,597	26,504,983
Other Foreign Countries	1,863,380	3,130,782	1,806,241
Total	56,731,969	69,536,113	91,411,142

TABLE NO. 11.—SUMMARY OF TOTAL VALUES APPEARING IN TABLE NO. 16 OF DAIRY PRODUCE imported into the United Kingdom for the years 1935, 1936 and 1937.

	1935.	1936.	1937.
From—	£	£	£
Irish Free State	2,473,071	2,822,739	2,346,887
Union of South Africa	609,678	564,826	510,887
Australia	9,806,132	8,900,254	8,649,419
New Zealand	16,131,751	18,559,240	21,032,951
Canada	1,888,781	2,351,705	3,098,253
Other British Countries	203,629	275,874	241,072
Soviet Union	1,678,376	1,644,958	1,258,328
Finland	744,807	902,663	992,601
Estonia	479,286	545,380	809,014
Latvia	701,861	846,502	1,071,278
Lithuania	679,662	1,017,243	1,135,784
Sweden	856,072	769,672	1,169,422
Norway	33,903	71,981	56,689
Denmark	13,023,905	14,733,673	16,716,807
Poland	912,257	1,420,365	1,185,336
Germany	22,391	14,805	32,216
Netherlands	4,360,942	6,504,084	7,466,242
Belgium	139,929	307,220	338,389
France	85,226	249,445	82,460
Switzerland	109,403	127,848	119,479
Italy	338,750	60,614	276,797
China	2,350,129	2,910,008	2,914,325
United States of America	70,790	5,547	63,412
Argentine Republic	281,369	727,165	635,046
Other Foreign Countries	437,129	969,291	784,637
Total	58,419,229	67,303,102	72,987,681

TABLE No. 12.—QUANTITIES AND VALUES OF CORN AND FOOD PRODUCTS imported into the United Kingdom in the Year 1937, with the Corresponding Figures for 1935 and 1936.

[*From Trade and Navigation Returns.*]

	Quantities.			Values		
	1935.	**1936.**	**1937.**	**1935.**	**1936.**	**1937.**
ANIMALS, LIVING, FOR FOOD:—	No.	No.	No.	£	£	£
Cattle	599,122	695,058	650,049	4,684,301	6,058,722	6,273,322
Sheep and lambs	278,969	455,583	311,752	356,812	645,739	551,090
Pigs	127,989	120,721	42,524	473,506	402,503	179,944
Total	1,006,080	1,271,362	1,004,325	5,464,619	7,106,964	7,004,356
GRAIN, FLOUR, &c :—	Cwt	Cwt	Cwt.	£	£	£
Wheat	101,225,904	100,772,480	96,883,523	30,463,899	37,950,086	49,844,543
Wheat meal and flour	7,981,469	8,366,523	8,540,892	3,219,366	3,848,352	5,449,997
Barley	17,097,486	18,294,415	18,191,954	4,160,341	5,006,490	7,287,956
Oats	3,553,614	2,161,092	1,207,868	1,038,205	604,685	485,888
Peas, not fresh	1,601,599	1,961,708	1,484,082	902,937	1,050,047	1,005,396
Beans, not fresh	595,426	1,265,462	747,021	308,294	556,978	461,251
Maize or Indian corn	59,455,687	73,293,065	71,760,413	12,176,121	16,262,217	21,424,173
Maize products	4,762,584	2,570,605	5,069,007	1,531,822	1,145,547	2,144,689
Oat products	419,134	515,278	464,857	450,418	600,081	566,469
All other products	983,025	887,566	505,852	728,860	696,753	675,679
Rice	2,161,457	2,217,974	2,311,043	905,284	1, 015,561	1,224,643
Other kinds of grain	936,945	666,554	489,155	295,392	193,338	189,699
Farinaceous substances not elsewhere specified	1,053,630	1,031,115	985,124	542,080	610,978	650,759
Total	201,827,960	214,003,782	208,590,791	56,731,969	69,536,113	91,411,142
DAIRY PRODUCE.—	Cwt.	Cwt.	Cwt.	£	£	£
Butter	9,608,016	9,740,735	9,416,366	39,328,128	44,385,148	47,359,297
Margarine	17,741	43,555	101,429	27,983	67,411	169,495
Cheese	2,714,351	2,676,371	2,936,879	6,649,093	7,783,747	9,256,941
Milk, condensed, unsweetened	293,978	232,336	328,323	519,980	364,558	546,585
Milk, condensed, sweetened	87,709	89,471	114,306	145,517	148,468	181,234
Milk, separated or skimmed	1,404,697	1,368,013	1,241,781	1,380,041	1,463,745	1,497,883
Milk powder, unsweetened	219,144	241,809	292,913	390,284	430,262	586,438
Cream	74,670	76,668	75,695	229,485	254,907	275,307
Other Produce not specified		.	.	45,527	35,915	66,445
Total	14,420,306	14,468,958	14,507,692	48,716,038	54,934,156	59,940,125
	Gt. Hunds	Gt. Hunds.	Gt. Hunds.	£	£	£
Eggs in Shell	19,766,811	24,606,921	24,781,642	7,768,489	9,885,935	10,440,053
	Cwt.	Cwt.	Cwt.			
Eggs not in Shell	814,980	921,841	918,108	1,934,702	2,483,011	2,607,508
Total value	.	..	..	9,703,191	12,368,946	13,047,556

TABLE No 13.—QUANTITIES AND VALUES OF MEAT OF ALL KINDS imported into the United Kingdom in the year 1937, with the corresponding figures for 1935 and 1936.

	Quantities.			Values.		
	1935.	1936.	1937.	1935.	1936.	1937.
	Cwt.	Cwt.	Cwt.	£	£	£
BEEF:—						
Fresh and salted . . .	2,292	5,365	4,223	3,695	8,606	6,632
Chilled	8,485,549	8,779,685	8,971,439	13,959,754	14,550,882	17,088,443
Frozen	1,720,927	1,490,304	1,762,317	2,349,045	1,906,076	2,663,645
Boned	594,010	665,607	856,033	840,918	906,690	1,440,747
Other descriptions . .	663,156	730,434	743,273	1,556,364	1,840,371	1,492,977
Tinned, canned, &c.—						
Tongues	89,676	95,023	105,520	774,520	772,490	891,952
Other parts . . .	889,382	917,085	978,389	1,860,219	2,242,434	2,548,421
Extracts and Essences .	61,755	87,531	45,792	406,927	555,295	257,221
VEAL—frozen, &c. . . .	179,905	191,475	18,927	317,351	310,109	32,449
MUTTON AND LAMB:—						
Mutton and Lamb—fresh .	53,347	21,324	15,620	163,952	69,689	56,753
Mutton—frozen . . .	1,714,464	1,344,281	1,498,725	2,816,143	2,452,758	2,774,842
Lamb—frozen . . .	4,983,693	4,955,451	5,304,189	4,574,185	14,789,833	16,136,646
Tinned, canned, &c. . .	63,899	68,031	72,889	197,720	185,602	226,220
Other descriptions . .	172,746	192,695	205,413	464,988	543,015	608,991
PIG PRODUCTS—						
Bacon	6,926,905	6,569,708	6,925,385	27,394,262	27,257,916	29,289,763
Hams	676,767	671,666	675,002	3,067,987	2,989,836	3,158,185
Pork—fresh . . .	142,841	116,042	54,475	342,868	289,901	150,250
Pork—chilled or frozen .	915,098	1,025,156	1,057,416	2,509,315	2,780,455	3,251,559
Tinned, canned—tongues, &c.	160,202	157,651	150,352	1,125,176	1,062,011	1,048,402
Other descriptions . .	165,907	182,718	174,972	292,519	366,346	317,028
RABBITS	271,022	236,402	217,964	358,612	353,076	372,944
ALL OTHER KINDS OF MEAT .	171,894	205,632	449,668	612,559	752,079	1,192,381
POULTRY—dead . . .	422,535	421,724	506,076	1,689,749	1,659,398	1,995,021
GAME—dead	20,562	30,947	29,966	80,286	126,669	143,973
Totals . .	29,549,484	29,161,957	30,828,965	77,739,114	78,770,957	87,140,445

TABLE No. 14.—SUMMARY OF TOTAL VALUES appearing in Table 13 of Meat imported into the United Kingdom for the years 1935, 1936 and 1937.

	Values.		
	1935.	1936.	1937.
From—	£	£	£
Irish Free State	2,438,879	2,545,860	2,499,632
Australia	7,924,899	7,606,187	10,245,432
New Zealand	12,892,888	13,136,369	14,347,946
Canada	4,770,466	5,954,458	7,682,272
Other British Countries . . .	327,860	231,270	391,777
Soviet Union	308,042	280,929	248,844
Latvia	125,707	144,636	154,627
Lithuania	658,809	816,135	830,308
Sweden	1,041,174	1,040,839	1,095,281
Denmark	16,291,376	15,322,472	15,742,360
Poland	1,914,829	1,965,281	2,183,855
Netherlands	2,226,112	2,246,995	2,234,960
France	175,218	142,262	112,721
Hungary	552,055	464,741	769,170
United States of America . .	3,359,760	2,741,454	2,545,879
Chile	423,086	522,560	504,829
Brazil	1,275,179	1,429,887	1,423,814
Uruguay	2,129,408	2,098,451	2,332,721
Argentine Republic . . .	17,569,007	18,788,734	20,611,419
Other Foreign Countries . . .	1,354,870	1,301,938	1,188,198
Totals . .	77,759,114	78,770,957	87,140,445

TABLE No. 15.—QUANTITY AND VALUE OF DEAD MEAT imported into the United Kingdom in the undermentioned Years.

	Quantities.			Values.		
	1935.	1936.	1937.	1935.	1936.	1937.
BEEF :—	Cwt.	Cwt.	Cwt.	£	£	£
Fresh and salted— Total . .	2,292	5,365	4,223	3,695	8,606	6,632
Chilled and frozen, from—						
Australia . . .	1,332,984	1,350,595	1,786,591	1,833,193	1,774,406	2,848,531
New Zealand . .	575,455	506,167	554,510	784,813	664,313	911,912
Other British Countries . . .	143,675	97,583	151,107	204,753	127,538	268,451
Brazil . . .	519,757	512,074	504,691	811,158	815,106	921,878
Uruguay . . .	603,531	581,373	637,282	985,470	901,751	1,140,608
Argentine Republic .	7,031,074	7,222,247	7,099,574	11,689,412	12,173,784	13,665,716
Other Foreign Countries . . .	..	..	1	..	..	2
Total . .	10,206,476	10,269,989	10,733,756	16,308,799	16,456,958	19,752,088
Boned, including Cheeks and Skirts, from—						
Australia . . .	237,215	314,756	403,710	345,688	427,668	693,523
New Zealand . .	217,617	210,846	271,819	302,858	285,576	450,618
Other British Countries . . .	88,485	86,838	114,812	116,186	114,305	180,216
Brazil . . .	16,843	14,440	23,153	21,815	19,306	38,528
Uruguay . . .	7,735	9,507	17,712	12,832	17,865	32,448
Argentine Republic	26,615	29,226	25,311	42,044	41,370	45,401
Other Foreign Countries . . .	..	..	16	..	..	23
Total . .	594,010	665,607	856,033	40,918	906,590	1,440,747
Other Descriptions from—						
Australia . . .	66,132	76,379	87,569	144,710	155,433	192,623
New Zealand . .	22,257	23,299	23,686	48,797	49,810	47,562
Other British Countries . . .	32,339	33,742	29,622	83,664	84,651	61,201
United States of America . .	39,750	46,491	24,788	125,149	162,808	64,207
Brazil . . .	58,394	77,045	76,263	186,739	214,799	149,978
Uruguay . . .	37,912	39,550	31,574	93,745	108,021	67,952
Argentine Republic	403,575	432,352	466,775	918,404	1,061,857	904,113
Other Foreign Countries . . .	2,297	1,576	2,696	5,156	3,492	5,346
Total . .	663,156	730,434	743,273	1,556,864	1,840,871	1,492,977
Tinned, canned, &c.— Tongues—Total .	89,676	95,023	105,520	774,520	772,490	891,952
Other, including Extracts & Essences Total . .	951,087	1,004,616	1,024,181	2,267,146	2,797,749	805,642
VEAL— Frozen—Total . .	179,905	191,475	18,927	317,351	310,109	32,449
MUTTON AND LAMB— Fresh—Total . .	53,347	21,324	15,620	168,952	69,689	56,758

TABLE No. 15.—QUANTITY AND VALUE OF DEAD MEAT—*Continued.*

	Quantities.			Values.		
	1935.	1936.	1937.	1935.	1936.	1937.
MUTTON—Frozen, from—	Cwt.	Cwt.	Cwt.	£	£	£
Australia . . .	424,050	227,097	405,614	693,878	421,720	720,344
New Zealand . .	1,041,563	888,864	861,832	1,754,720	1,616,742	1,637,168
Other British Countries . . .	..	350	4,582	..	613	8,481
Chile	89,326	95,750	94,327	129,856	177,128	163,339
Uruguay . . .	6,232	8,210	16,558	10,635	13,945	28,341
Argentine Republic	150,423	121,905	110,946	223,070	219,406	202,407
Other Foreign Countries . . .	2,870	2,063	4,571	3,984	3,204	8,762
Total . .	1,714,464	1,344,281	1,498,725	2,816,143	2,452,758	2,774,842
LAMB—Frozen from—						
Australia . . .	1,360,158	1,268,009	1,477,348	3,934,093	3,698,058	4,351,242
New Zealand . .	2,591,399	2,641,494	2,741,204	8,068,996	8,264,409	8,754,457
Other British Countries . . .	18	558	4,174	51	1,529	11,704
Chile	118,554	111,209	116,063	271,858	316,386	318,089
Uruguay . . .	130,176	118,055	148,408	327,257	316,870	418,157
Argentine Republic	754,827	777,996	778,986	1,898,688	2,091,387	2,179,907
Other Foreign Countries . . .	28,561	37,230	38,006	77,642	101,194	108,090
Total . .	4,983,693	4,955,451	5,304,189	14,574,185	14,789,833	16,136,646
Tinned, Canned, &c. Total . .	63,899	68,051	72,889	197,720	185,602	226,220
Other Descriptions Total . .	172,746	192,695	205,413	464,988	548,015	603,991
PIG PRODUCTS:—						
Bacon from—						
Irish Free State .	458,410	505,162	509,809	1,345,523	1,551,878	1,628,738
Canada . . .	919,064	1,092,360	1,387,006	3,307,771	4,282,271	5,616,812
Other British Countries . . .	640	421	442	2,174	1,452	1,979
Estonia . . .	45,521	43,175	40,506	174,566	172,646	167,454
Latvia . . .	32,810	36,366	37,096	125,195	144,588	154,170
Lithuania . . .	165,318	193,605	187,949	623,185	757,562	774,809
Sweden . . .	257,409	241,604	250,046	1,018,889	1,019,019	1,080,527
Denmark . . .	3,826,386	3,373,415	3,420,427	15,964,784	14,954,230	15,366,125
Poland . . .	430,456	408,432	442,382	1,612,052	1,623,082	1,827,111
Netherlands . .	508,666	484,737	481,007	2,068,717	2,061,970	2,071,492
United States of America . .	20,011	16,935	6,069	77,483	61,088	27,790
Other Foreign Countries . . .	262,196	173,496	152,686	874,423	628,185	573,261
Total . .	6,926,905	6,569,708	6,925,385	27,394,262	27,257,916	29,289,763
Hams, from—						
Irish Free State .	20,207	22,522	15,619	68,813	77,616	60,114
Canada . . .	190,695	277,678	314,606	893,584	1,253,648	1,500,955
Other British Countries . . .	3	210	..	21	806	11
Poland . . .	21,870	12,385	2,751	97,417	52,927	12,982
United States of America . .	419,231	332,848	311,746	1,909,821	1,501,893	1,457,370
Argentine Republic.	20,159	24,465	29,229	79,285	94,722	119,606
Other Foreign Countries . . .	4,602	1,558	1,051	19,046	8,724	7,147
Total . .	676,767	671,666	675,002	3,067,987	2,989,336	3,158,185
Pork—Fresh Total . .	142,841	116,042	54,475	342,868	289,901	150,250

TABLE No. 15.—QUANTITY AND VALUE OF DEAD MEAT—*Continued.*

	Quantities.			Values.		
	1935.	1936.	1937.	1935.	1936.	1937.
PIG PRODUCTS (*contd.*)— Pork—Chilled or frozen, from—	Cwt.	Cwt.	Cwt.	£	£	£
Australia . . .	146,751	232,514	233,892	388,931	622,448	691,393
New Zealand . .	490,301	579,088	592,648	1,279,103	1,500,802	1,740,074
Other British Countries . . .	7,546	5,131	7,824	24,714	18,313	31,479
United States of America . .	77,079	10,728	21,706	250,825	43,585	94,344
Argentine Republic	186,842	190,371	194,001	549,734	575,936	672,509
Other Foreign Countries . . .	6,579	7,324	7,345	16,008	19,371	21,760
Total . .	915,098	1,025,156	1,057,416	2,509,315	2,780,455	3,251,559
Tinned, Canned, Tongues, &c. Total . .	327,109	340,369	325,324	1,417,695	1,428,357	1,365,430
RABBITS—Fresh Total . .	25,076	73,504	94,737	88,729	142,590	189,117
Frozen, from—						
Australia . . .	206,686	130,340	104,060	222,565	161,658	154,920
Other British Countries . . .	37,400	29,835	18,326	40,512	40,148	26,381
Foreign Countries .	1,770	2,683	781	6,806	8,680	2,526
Total . .	245,946	162,808	123,167	269,883	210,486	183,827
ALL OTHER KINDS OF MEAT— Tinned, Canned, &c. Total . .	171,894	205,632	449,668	612,559	752,079	1,192,381
POULTRY—Dead from—						
Irish Free State .	105,050	104,218	103,076	418,934	414,792	430,166
Other British Countries . . .	27,949	26,300	41,678	145,320	141,386	209,621
Soviet Union . .	13,974	17,544	29,872	71,203	54,735	81,294
Netherlands . .	7,223	7,703	10,201	31,287	35,425	45,335
Austria . . .	3,892	1,657	437	15,532	6,427	1,884
Hungary . . .	119,310	105,282	181,062	457,046	396,004	685,426
Yugoslavia . .	72,820	66,809	45,166	269,787	215,615	160,702
Other Foreign Countries . . .	72,317	92,211	94,584	280,400	365,014	380,593
Total . .	422,535	421,724	506,076	1,689,749	1,659,898	1,995,021
GAME—Dead Total . .	20,562	30,947	29,966	80,286	126,669	148,978
TOTAL of all Meat .	29,549,484	29,161,957	30,828,965	77,759,114	78,770,957	87,140,445

TABLE No. 16.—QUANTITIES AND VALUES OF BUTTER, MARGARINE, CHEESE, MILK PRODUCTS, AND EGGS imported into the United Kingdom in each Year from 1935 to 1937 inclusive.

[*From Trade and Navigation Returns.*]

	Quantities.			Values.		
	1935.	**1936.**	**1937.**	**1935.**	**1936.**	**1937.**
BUTTER from—	Cwt	Cwt.	Cwt.	£	£	£
Irish Free State	488,467	468,272	319,957	1,505,165	1,694,327	1,311,304
Union of South Africa .	82,349	75,498	69,126	343,822	322,218	312,553
Australia .	2,113,408	1,694,189	1,491,937	8,388,095	7,672,519	7,521,585
New Zealand .	2,637,502	2,791,823	2,950,963	11,571,543	13,438,606	15,352,026
Other British Countries .	113,427	98,934	78,601	546,091	482,902	446,358
Soviet Union.	503,192	412,053	273,365	1,669,537	1,644,958	1,258,328
Finland . .	115,707	159,761	157,872	485,898	711,446	762,202
Estonia . .	119,343	116,329	159,882	424,491	492,855	781,341
Latvia . .	192,336	196,396	216,880	696,687	827,080	1,043,831
Lithuania .	180,667	210,821	204,540	634,236	883,721	975,576
Sweden . .	184,285	149,443	204,490	750,809	687,759	1,027,118
Denmark .	2,186,350	2,171,594	2,256,490	9,965,750	10,769,717	11,900,574
Poland . .	99,158	188,714	105,395	341,264	709,834	485,566
Netherlands .	463,811	745,313	716,614	1,548,655	3,008,285	3,292,116
Argentine Republic. .	68,964	142,528	129,652	227,636	558,594	505,757
Other Foreign Countries .	59,030	119,067	80,602	228,449	480,687	383,067
Total .	9,608,016	9.740,735	9,416,366	39,328,128	44,385,148	47,359,297
MARGARINE—	Cwt	Cwt.	Cwt.	£	£	£
Total .	17,741	43,555	101,429	27,983	67,411	169,495
CHEESE from—	Cwt	Cwt.	Cwt	£	£	£
Australia .	134,249	91,008	119,580	303,768	239,112	351,914
New Zealand .	1,762,915	1,681,128	1,730,770	4,198,564	4,770,576	5,392,128
Canada . .	470,533	602,541	722,277	1,236,560	1,926,353	2,459,716
Other British Countries .	30,456	30,694	32,386	72,381	83,918	100,551
Netherlands .	199,217	181,614	217,327	301,756	325,450	434,460
Switzerland .	14,707	17,052	17,400	100,514	115,180	109,698
Italy . .	79,893	14,005	61,681	336,902	60,299	274,158
Other Foreign Countries .	22,381	58,329	35,458	98,648	262,859	134,316
Total .	2,714,351	2,676.371	2,936,879	6,649,093	7,783,747	9,256,941
CREAM—	Cwt.	Cwt.	Cwt.	£	£	£
Total .	74,670	76,668	75,695	229,485	254,907	275,807
MILK—Condensed—	Cwt.	Cwt.	Cwt.	£	£	£
Unsweetened Total .	293,978	232,336	328,323	519,980	364,553	546,585
Sweetened—	Cwt.	Cwt	Cwt.	£	£	£
Whole—Total .	87,709	89,471	114,306	145,517	148,468	181,234

TABLE 16.—QUANTITIES AND VALUES OF BUTTER, &c —*Continued.*

	Quantities			Values.		
	1935.	1936.	1937.	1935.	1936.	1937.
MILK—separated or skimmed—	Cwt.	Cwt.	Cwt.	£	£	£
Total .	1,404,697	1,363,013	1,241,781	1,380,041	1,463,745	1,497,883
MILK POWDER—unsweetened—	Cwt	Cwt.	Cwt.	£	£	£
Total .	219,144	241,809	292,913	390,284	430,262	586,438
EGGS IN SHELL from—	Great Hundreds	Great Hundreds	Great Hundreds	£	£	£
Irish Free State	2,394,980	2,563,231	1,949,225	711,177	796,733	667,816
Union of South Africa . .	360,901	371,705	256,738	213,066	209,598	150,119
Australia .	1,921,122	1,634,851	1,263,243	1,091,655	946,777	721,530
Other British Countries .	139,013	138,081	151,845	77,634	76,283	88,040
Finland . .	641,517	371,552	501,687	252,157	185,623	218,419
Sweden . .	272,592	186,409	332,685	105 063	81,500	142,180
Denmark .	6,564,046	7,987,540	9,992,919	2,688,777	3,514,281	4,393,195
Poland . .	2,014,888	2,563,731	2,256,817	570,880	710,531	699,770
Netherlands .	2,677,980	3,799,084	4,309,625	1,001,613	1,550,957	1,944,858
Belgium . .	256,101	539,927	436,268	120,793	229,555	202,343
China . .	1,219,887	1,329,175	1,090,542	468,029	506,094	396,271
Other Foreign Countries .	1,303,784	3,121,635	2,190,048	467,645	1,078,003	815,512
Total .	19,766,811	24,606,921	24,731,642	7,768,489	9,885,935	10,440,053
EGGS NOT IN SHELL—	Cwt.	Cwt.	Cwt.	£	£	£
Liquid or frozen from—British Countries . .	1,736	7,039	2,636	4,881	20,778	6,631
China . .	768,590	859,454	859,356	1,612,984	2,075,518	2,199,593
Other Foreign Countries .	17,089	20,932	21,889	43,890	55,566	60,571
Total .	787,415	887,425	883,881	1,661,755	2,151,862	2,266,795
EGGS—other sorts	Cwt.	Cwt.	Cwt.	£	£	£
Total .	27,565	34,416	34,227	272,947	331,149	340,708
OTHER KINDS OF DAIRY PRODUCE—				£	£	£
Total .		..	..	45,527	35,915	66,445
Total Value of Dairy Produce	..	..	...	58,419,229	67,303,102	72,987,681

TABLE No. 17.—OTHER ARTICLES AFFECTING AGRICULTURE.

	Quantities.			Values.		
	1935.	1936.	1937.	1935.	1936.	1937.
FRUIT, VEGETABLES, &c.:—	Cwt.	Cwt.	Cwt.	£	£	£
Apples	7,241,820	5,627,558	5,502,692	6,960,262	5,481,732	4,964,949
Peaches and Nectarines	106,855	71,670	99,915	224,475	150,000	265,005
Plums, Greengages, Damsons	421,796	280,768	234,674	796,544	435,861	487,159
Pears	1,272,775	1,153,816	1,123,190	1,673,800	1,455,514	1,471,406
Grapes	933,585	699,080	741,459	1,564,025	1,411,575	1,702,097
Oranges	10,305,307	9,535,919	12,492,789	7,967,623	7,185,133	7,955,601
Lemons, Limes, &c.	1,339,900	994,841	1,166,377	1,174,516	1,036,480	1,083,563
	Bunches.	Bunches	Bunches.			
Bananas	20,063,567	20,442,110	22,632,559	4,779,513	4,513,177	5,146,459
	Cwt.	Cwt.	Cwt.			
Grape-Fruit	1,177,616	1,119,288	1,318,595	1,331,502	1,042,483	1,005,885
Apricots	63,024	105,479	52,297	109,591	185,872	96,662
Nuts used as Fruit	919,664	810,272	678,489	2,502,099	2,725,631	2,625,704
Fruit (unenumerated)	1,083,244	958,664	1,073,840	1,060,568	1,015,803	1,233,513
Onions *	5,232,238	5,217,022	4,804,790	1,317,597	1,371,864	1,517,732
Potatoes	3,816,087	6,327,551	4,446,168	2,778,933	3,082,600	2,282,764
Tomatoes	2,975,244	2,831,206	2,714,416	3,999,922	3,881,645	4,491,754
Vegetables, unenumerated (raw)	644,273	1,262,163	954,633	882,560	1,363,888	1,046,425
Total value	..	..	..	39,123,530	36,319,358	37,826,193
OTHER ARTICLES:—	Cwt.	Cwt.	Cwt.	£	£	£
Lard	1,531,111	1,520,618	1,471,176	4,290,790	3,939,706	4,148,200
	Thous. lb.	Thous. lb.	Thous. lb.			
Wool—sheep and lambs'	864,061	913,896	783,824	35,582,813	43,928,422	49,703,697
Wood and timber—	Loads.	Fathoms.	Piled Cubic Fathoms.			
Pit-props or pit-wood	2,324,162	824,027	1,045,219	3,528,927	3,498,729	7,581,182
	Standards.	Standards.	Standards.			
Sawn, soft	5,557,585	2,018,783	2,063,738	17,380,305	22,536,960	30,921,446
	Loads.	Tons.	Tons.			
Staves	60,910	62,607	66,207	339,636	491,638	744,222
Feeding-stuffs for animals	1,611,120	1,726,431	1,815,425	7,712,089	8,458,376	11,394,446
Seeds—	Cwt.	Cwt.	Cwt.			
Clover and grass	227,879	205,810	154,816	474,642	507,169	407,362
	Tons.	Tons.	Tons.			
Cotton	653,673	600,640	672,126	3,717,149	3,643,302	4,642,016
Flax or linseed	256,909	272,687	286,034	2,488,066	3,374,418	3,864,557
Rape	30,387	22,900	23,350	278,712	254,706	316,095
Soya beans	158,984	81,978	98,916	1,048,175	634,872	849,067
Superphosphates	30,466	29,050	23,314	60,222	55,684	53,192
Phosphates of lime	383,875	427,490	446,258	537,405	633,206	736,442
	Cwt.	Cwt.	Cwt.			
Nitrate-sodium	716,848	971,505	935,959	154,508	222,481	210,437
Nitrate-potassium	187,764	85,163	78,088	101,070	66,46	56,798
	Centals.	Centals.	Centals.			
Cotton, raw of 100 lb.	12,720,523	15,461,825	16,588,485	35,988,943	44,238,406	46,845,145
	Tons.	Tons.	Tons.			
Hemp	95,010	95,423	103,510	1,865,902	2,480,99	3,106,759
Flax	56,177	65,848	56,120	4,120,902	4,431,801	4,867,761
Hides untanned—	Cwt.	Cwt.	Cwt.			
Dry	546,161	687,668	726,175	1,397,732	2,032,197	2,844,946
Wet	1,140,757	1,194,988	1,156,915	2,759,937	3,245,880	4,062,917
	Thousand Gallons.	Thousand Gallons.	Thousand Gallons.			
Petroleum (refined)	2,306,222	2,405,091	2,561,629	29,424,000	32,831,612	43,118,716
Petroleum (crude)	488,516	511,744	529,951	4,138,687	4,204,861	5,011,752

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* Quantities shown for 1935 and 1936 have been converted from bushels to cwt. on the basis of 2 bushels to 1 cwt.

TABLE No. 18.—NUMBER AND VALUE OF LIVE CATTLE, SHEEP, PIGS, AND OTHER ANIMALS FOR FOOD imported into the United Kingdom in the undermentioned Years. [*From Trade and Navigation Returns.*]

	Number.			Value.		
	1935.	1936.	1937.	1935.	1936.	1937.
CATTLE, from—	No.	No.	No.	£	£	£
Irish Free State . .	592,644	657,301	640,906	4,529,150	5,420,874	6,114,699
Canada	6,478	37,757	9,053	105,151	637,878	158,623
Other countries . .	.	..	..	..	..	..
Total . . .	599,122	695,058	650,049	4,634,301	6,058,752	6,273,322
SHEEP AND LAMBS, from— Irish Free State . .	278,969	455,583	311,752	356,812	645,739	551,090
PIGS, from— Irish Free State . .	127,989	120,721	42,524	473,506	402,503	179,944
ALL OTHER ANIMALS .	707,342	929,718	902,834	104,887	125,564	117,971
Total Value .	..	..	..	5,569,506	7,232,528	7,122,827

TABLE No. 19.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS imported into Great Britain from Ireland in each of the Years 1931-1937.

	1931.	1932.	1933.	1934.	1935.	1936.	1937.
HORSES :—							
Stallions . .	407	367	333	412	375	483	427
Mares . .	3,862	3,699	3,905	4,942	4,886	4,310	4,012
Geldings . .	4,101	4,029	5,033	6,830	6,744	6,190	5,412
Total . .	8,370	8,095	9,271	12,184	12,005	10,983	9,851
CATTLE : Oxen, Bulls, and Cows :—							
Fat . . .	268,677	223,901	238,036	165,006	219,207	208,813	174,991
Store . . .	431,659	404,169	368,214	390,823	531,316	572,560	588,073
Other cattle .	67,806	55,633	44,732	62,664	71,437	70,710	71,348
Calves . .	65,298	61,201	58,352	33,963	32,204	24,755	13,426
Total . .	833,440	744,904	709,334	652,456	854,164	876,838	847,838
SHEEP :—							
Sheep. . .	316,847	227,975	169,937	165,257	194,996	256,834	171,806
Lambs . .	355,448	350,588	282,964	328,859	275,071	371,062	289,332
Total . .	672,295	578,563	452,901	494,116	470,067	627,896	461,138
PIGS :—							
Fat . . .	424,067	241,458	119,691	150,634	205,026	156,994	202,477
Store . . .	5,393	3,580	3,123	3,795	2,564	1,412	2,978
Total . .	429,460	245,038	122,814	154,429	207,590	158,406	205,455

TABLE No. 20.—RETURN OF THE AVERAGE PRICES OF WOOL in the Years 1936 and 1937.

Years.	Australian.	South African.	English Fleeces.
	Per lb. *s.* *d.*	Per lb. *s.* *d.*	Per lb. *s.* *d.* *s.* *d.*
1936 . . .	1 1½	0 11	0 8¾ to 1 4½
1937 . . .	4½	1 1	1 3¼ ,, 1 7½

EDINBURGH CORN MARKET.

STATEMENT SHOWING THE PRICES OF WHEAT, BARLEY, AND OATS FOR THE YEAR 1937.

The offering of grain by farmers and others in the area of the Market was not resumed during the year. It is hoped that advantage will be taken of the privilege afforded to farmers and merchants of offering grain in the open market, as undoubtedly it enables them to secure the market value, and gives a desirable indication of the true value of the various grains.

The Corn Sales Act of 1921 provides that all sales are to be effected by weight only, and expressed in terms of or by reference to the hundredweight of 112 lb. Experience has proved it to be convenient to quote at a price per 4½ cwt. for Wheat, 4 cwt. for Barley, and 3 cwt. for Oats.

The following statement gives a record of the year's proceedings in Edinburgh Corn Market.

1937.		WHEAT, per 4½ cwt.				BARLEY, per 4 cwt.				OATS, per 3 cwt.			
		Highest.		Lowest		Highest.		Lowest		Highest		Lowest.	
		s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
January	6	46	6	45	6	50	0	36	0	26	0	24	6
"	13	46	0	45	6	50	0	38	0	26	0	24	0
"	20	45	0	44	0	50	0	40	0	25	6	23	6
"	27	42	0	.		50	0	39	0	24	9	22	6
February	3	40	6	40	0	50	0	39	0	24	9	22	6
"	10	41	6	41	0	48	0	39	0	25	0	22	6
"	17	41	0	40	0	48	0	38	6	25	6	23	0
"	24	39	0	38	6	46	0	38	0	25	0	22	6
March	3	39	0	38	0	44	0	38	0	25	6	22	6
"	10	39	6	39	0	44	0	38	0	25	0	22	6
"	17	42	0	41	6	44	0	38	0	25	0	22	6
"	24	44	6	44	0	46	0	40	0	25	0	22	6
"	31	47	0	46	0	48	0	40	0	25	6	23	0
April	7	48	0	47	6	47	6	42	0	26	6	23	6
"	14	47	0	46	6	47	6	42	0	27	0	24	6
"	21	45	6	45	0	..		..		27	0	25	0
"	28	44	6	44	0	..		..		27	0	25	6
May	5	44	6	44	0	..		..		27	6	25	0
"	11	44	6	44	0	..		..		27	6	25	6
"	19	45	0	44	6	..		..		28	0	25	6
"	26	45	0	44	0	..		..		27	0	25	6
June	2	44	6	44	0	..		..		27	6	25	0
"	9	43	0	42	6	.		..		20	6	25	0
"	16	42	6	42	0	..		..		26	6	24	6
"	23	42	6	42	0	..		..		26	6	24	6
"	30	43	0	42	6	..		..		26	6	24	6
July	7	44	6	44	0	..		..		27	0	24	6
"	14	45	0	44	6	..		..		27	6	25	0
"	21	44	6	44	0	..		..		27	9	25	0
"	28	44	0	43	0	..		..		27	9	25	6
August	4	44	3	44	0	..		..		27	9	25	6
"	11	43	6	..		..		..		27	0	25	6
"	18	43	6	43	0	..		..		26	9	25	6
"	25	42	6	42	0	..		..		25	6	24	6
September	1	41	0	38	0	..		..		25	0	24	0
"	8	38	6	38	0	48	0	40	0	26	0	24	6
"	15	40	6	37	6	50	0	42	0	24	6	24	0
"	22	37	0	34	6	50	0	40	0	24	3	24	0
"	29	38	6	38	0	50	0	38	0	24	6	23	9
October	6	39	0	38	6	50	0	38	0	25	0	24	6
"	13	39	0	38	6	51	0	40	0	25	0	23	0
"	20	38	0	37	6	52	0	38	6	25	0	23	0
"	27	38	0	..		52	0	40	0	25	0	24	0
November	3	37	6	37	0	54	0	42	0	25	6	24	0
"	10	37	0	36	0	51	0	42	0	25	0	22	3
"	17	37	6	35	0	50	0	40	0	24	6	23	0
"	24	37	0	36	3	51	0	40	0	24	0	22	6
December	1	36	6	36	0	51	0	40	0	24	0	22	0
"	8	36	6	36	0	50	0	40	0	24	0	22	0
"	15	36	6	36	0	51	0	40	0	24	6	22	6
"	22	36	6	36	0	52	0	42	0	24	6	23	0
"	29	36	6	36	0	52	0	41	0	24	6	22	6

PRICES OF SHEEP SINCE 1818.

TABLE No. 1.—CHEVIOT SHEEP.

Year.	Wethers					Ewes.					Lambs.				
	s.	d.		s.	d.	s.	d.		s.	d.	s.	d.		s.	d.
1818	28	0	to	30	0	not quoted.					8	0	to	10	0
1819	25	0	"	27	0	15	0	to	17	0	10	6	"	12	0
1820	20	0	"	25	0	16	0	"	17	0	10	0	"	11	0
1821	18	0	"	20	0	14	0	"	16	0	7	6	"	8	0
1822	12	6	"	13	0	8	0	"	8	6	4	0	"	6	0
1823	13	6	"	18	0	7	0	"	10	6	5	6	"	6	0
1824	14	0	"	19	0	7	0	"	9	0	4	6	"	6	0
1825	29	0	"	32	0	15	0	"	19	0	9	0	"	10	6
1826	17	6	"	21	6	13	0	"	15	0	7	0	"	7	6
1827	15	0	"	24	0	not quoted					7	0	"	8	6
1828	18	0	"	27	6	12	0	to	15	0	7	0	"	8	3
1829	18	0	"	24	0	12	6	"	14	0	7	0	"	8	6
1830	15	0	"	21	0	8	0	"	11	0	6	6	"	6	9
1831	18	0	"	25	0	9	0	"	13	0	7	0	"	8	0
1832	19	0	"	24	0	11	0	"	16	0	7	0	"	9	0
1833	22	0	"	31	0	13	6	"	20	0	8	0	"	11	3
1834	22	0	"	31	0	13	6	"	21	0	9	0	"	11	6
1835	22	0	"	27	6	18	0	"	20	6	8	0	"	11	0
1836	24	0	"	31	6	16	0	"	19	0	10	0	"	14	0
1837	19	0	"	28	0	14	0	"	19	0	10	0	"	13	0
1838	23	0	"	30	6	17	0	"	22	0	12	0	"	14	0
1839	23	0	"	31	0	14	0	"	19	0	6	0	"	13	0
1840	24	0	"	33	0	15	0	"	23	0	7	0	"	11	6
1841	23	0	"	30	0	14	0	"	22	0	8	0	"	12	6
1842	22	6	"	28	0	13	0	"	17	0	7	6	"	10	6
1843	19	0	"	25	0	8	0	"	12	0	5	0	"	8	0
1844	21	0	"	29	0	10	0	"	16	0	8	0	"	10	6
1845	28	0	"	33	0	13	0	"	20	0	8	0	"	13	0
1846	24	0	"	33	0	14	6	"	21	6	10	0	"	14	0
1847	24	0	"	35	0	13	0	"	24	6	11	6	"	15	0
1848	23	0	"	34	6	13	0	"	23	0	11	6	"	15	0
1849	21	0	"	30	2	12	0	"	21	0	9	0	"	14	0
1850	20	6	"	29	6	12	0	"	20	0	8	0	"	13	6
1851	21	6	"	31	0	13	0	"	21	0	8	9	"	14	6
1852	21	0	"	32	0	15	0	"	23	0	8	0	"	14	0
1853	26	6	"	33	0	17	0	"	23	6	9	0	"	17	0
1854	25	0	"	36	0	17	0	"	26	0	9	0	"	16	6
1855	23	6	"	36	0	16	0	"	25	0	10	0	"	17	9
1856	22	0	"	35	6	15	6	"	24	0	10	0	"	15	6
1857	24	0	"	36	0	14	6	"	26	0	10	6	"	14	6
1858	24	0	"	34	0	14	0	"	24	6	10	6	"	14	0
1859	25	0	"	34	6	16	0	"	25	0	10	3	"	14	9
1860	26	0	"	38	0	17	6	"	27	6	12	6	"	17	6
1861	25	0	"	38	6	16	0	"	28	0	9	0	"	16	0
1862	27	0	"	37	6	17	6	"	28	0	10	0	"	16	0
1863	25	0	"	38	6	19	0	"	28	6	10	6	"	16	0
1864	31	0	"	41	0	21	0	"	31	6	14	0	"	18	0
1865	32	6	"	44	0	22	6	"	33	6	14	6	"	20	0
1866	37	0	"	50	0	29	0	"	42	6	15	0	"	26	0
1867	26	0	"	58	0	18	0	"	25	6	12	0	"	16	0
1868	30	0	"	32	0	15	6	"	21	0	7	6	"	13	0
1869	28	0	"	38	0	15	0	"	22	6	7	6	"	14	0
1870	35	6	"	48	0	18	0	"	28	0	10	0	"	17	0
1871	36	6	"	49	0	23	0	"	33	6	14	0	"	20	0
1872	45	0	"	56	0	32	0	"	42	0	16	0	"	22	0
1873	42	0	"	51	0	25	0	"	42	6	15	6	"	22	0
1874	38	6	"	44	6	21	0	"	36	6	12	0	"	17	0

TABLE No. 1.—CHEVIOT SHEEP—*Continued.*

Year.	Wethers.					Ewes.					Lambs.				
	s.	d.		s.	d.	s.	d.		s.	d.	s.	d.		s.	d.
1875	33	0	to	48	6	21	0	to	34	0	13	6	to	23	6
1876	40	0	"	52	6	23	0	"	30	0	13	6	"	25	0
1877	41	0	"	51	0	25	0	"	37	0	15	0	"	24	0
1878	35	6	"	48	0	23	6	"	35	0	14	0	"	22	0
1879	34	0	"	44	0	21	0	"	34	0	14	0	"	20	0
1880	30	0	"	43	6	20	0	"	30	0	12	6	"	20	0
1881	32	0	"	45	6	29	0	"	34	0	14	0	"	20	0
1882	40	0	"	51	0	30	0	"	40	0	14	0	"	20	6
1883	44	0	"	55	6	34	6	"	46	6	15	6	"	23	0
1884	36	0	"	47	6	29	6	"	41	6	12	6	"	20	0
1885	30	0	"	38	0	24	0	"	31	0	12	0	"	18	0
1886	32	0	"	40	0	21	0	"	29	0	12	6	"	19	0
1887	29	0	"	36	0	18	0	"	26	0	11	0	"	16	6
1888	30	0	"	38	0	19	0	"	27	0	12	0	"	17	6
1889	36	0	"	44	0	24	0	"	32	0	14	0	"	22	0
1890	31	0	"	40	0	22	0	"	30	0	12	6	"	20	0
1891	27	0	"	38	0	16	0	"	25	0	9	0	"	16	0
1892	22	0	"	30	6	13	0	"	22	0	5	0	"	11	0
1893	26	0	"	35	6	18	0	"	28	6	8	6	"	15	0
1894	26	0	"	37	0	20	0	"	31	0	10	6	"	18	6
1895	28	0	"	39	0	22	0	"	34	0	11	6	"	19	6
1896	24	6	"	34	0	19	0	"	30	6	9	0	"	16	6
1897	27	0	"	36	0	21	0	"	31	6	11	0	"	17	6
1898	27	0	"	37	0	22	0	"	32	6	12	0	"	18	6
1899	24	0	"	33	0	20	0	"	30	6	10	6	"	16	0
1900	26	0	"	36	0	22	0	"	32	6	12	0	"	17	0
1901	25	0	"	32	6	20	0	"	29	6	11	0	"	16	0
1902	24	0	"	31	6	18	0	"	27	6	9	6	"	14	6
1903	26	0	"	34	0	21	0	"	31	0	11	4	"	18	0
1904	28	6	"	36	6	23	0	"	32	6	13	0	"	20	0
1905	27	6	"	35	0	23	0	"	33	0	14	0	"	21	0
1906	30	0	"	38	0	26	0	"	34	6	15	0	"	23	0
1907	28	0	"	34	0	22	0	"	30	6	13	6	"	19	6
1908	26	0	"	32	6	21	0	"	27	6	11	6	"	17	0
1909	24	0	"	31	0	18	0	"	25	6	9	6	"	16	0
1910	27	0	"	35	0	22	0	"	31	0	12	0	"	20	0
1911	24	0	"	31	6	18	6	"	27	6	10	6	"	18	0
1912	26	0	"	34	6	22	0	"	31	0	13	0	"	21	0
1913	30	0	"	39	0	24	0	"	35	6	16	0	"	24	0
1914	32	6	"	41	0	28	0	"	39	0	18	0	"	27	6
1915	36	0	"	46	0	31	0	"	44	0	20	0	"	30	6
1916	40	6	"	51	0	34	0	"	49	0	22	0	"	34	6
1917	43	6	"	56	0	38	0	"	56	0	24	0	"	34	0
1918	50	6	"	66	0	42	0	"	61	0	25	0	"	37	0
1919	53	0	"	69	0	44	6	"	67	0	28	0	"	40	6
1920	56	0	"	91	0	48	0	"	79	0	34	0	"	49	0
1921	45	0	"	60	0	52	3	"	85	9	33	9	"	52	3
1922	40	0	"	56	0	56	0	"	90	6	27	0	"	50	0
1923	44	0	"	65	0	61	0	"	106	0	30	0	"	62	0

Year.	Wethers.					Ewes.					Lambs.									
											Wethers.					Ewes.				
	s.	d.		s.	d	s.	d.		s.	d.	s.	d.		s.	d.	s	d.		s.	d.
1924	41	0	to	61	0	60	0	to	100	0	31	6	to	58	0	40	0	to	85	6
1925	39	3	"	50	0	56	0	"	88	9	22	3	"	50	6	36	0	"	82	0
1926	35	0	"	49	3	34	6	"	64	6	26	3	"	42	0	28	6	"	66	6
1927	28	9	"	46	3	32	6	"	55	6	23	3	"	39	0	25	3	"	52	0
1928	28	3	"	48	6	30	6	"	55	6	22	9	"	47	0	28	0	"	45	0
1929	33	6	"	54	6	34	6	"	62	0	25	6	"	47	0	30	6	"	51	9
930	36	0	"	54	0	35	0	"	74	6	24	0	"	47	3	30	0	"	59	0
1931	24	0	"	45	6	23	0	"	50	6	17	0	"	37	0	21	0	"	57	6
1932	16	0	"	26	6	18	0	"	36	6	10	6	"	24	6	12	0	"	38	0
1933	16	0	"	28	0	25	3	"	40	0	16	0	"	31	6	19	6	"	33	0
1934	16	0	"	34	3	22	6	"	44	6	19	3	"	33	3	18	6	"	43	0
1935	22	0	"	37	3	24	0	"	44	3	16	0	"	33	3	17	0	"	40	6
1936	24	6	"	50	0	29	0	"	55	0	18	6	"	37	6	23	0	"	4	6
1937	24	6	"	49	6	29	0	"	75	6	19	0	"	45	3	27	0	"	68	0

TABLE No. 2.—BLACKFACE SHEEP.

Year.	Wethers.	Ewes.	Lambs.
	s. d. s. d.	s. d. s. d.	s. d. s. d.
1819	22 0 to 24 0	12 0 to 15 0	8 0 to 9 0
1820	20 0 〃 22 3	15 6 〃 17 0	7 0 〃 8 6
1821	18 0 〃 20 0	12 0 〃 13 0	6 0 〃 7 0
1822	11 6 〃 13 6	5 6 〃 6 0	4 6 〃 0 0
1823	12 0 〃 16 0	5 0 〃 6 6	4 0 〃 5 3
1824	9 6 〃 13 6	6 0 〃 7 0	4 0 〃 5 0
1825	22 0 〃 26 0	11 0 〃 13 6	6 0 〃 9 0
1826	15 0 〃 17 0	8 0 〃 9 0	4 6 〃 6 0
1827	14 0 〃 18 6	7 0 〃 10 0	6 0 〃 7 6
1828	15 0 〃 20 0	8 0 〃 11 0	5 0 〃 7 6
1829	14 0 〃 18 0	9 0 〃 10 0	6 0 〃 7 0
1830	9 6 〃 13 0	4 0 〃 6 0	4 6 〃 6 0
1831	13 0 〃 17 0	5 0 〃 7 6	5 0 〃 6 6
1832	14 0 〃 18 0	7 0 〃 11 6	6 0 〃 7 3
1833	16 0 〃 24 0	7 6 〃 12 0	6 6 〃 9 0
1834	16 0 〃 22 0	10 0 〃 13 0	6 0 〃 8 6
1835	15 0 〃 18 9	10 0 〃 18 0	7 0 〃 8 0
1836	15 0 〃 21 0	9 0 〃 12 0	8 6 〃 11 0
1837	13 0 〃 16 0	8 0 〃 12 0	8 0 〃 9 6
1838	15 0 〃 20 6	10 0 〃 13 0	not quoted
1839	15 0 〃 22 0	10 0 〃 12 0	7 0 to 8 3
1840	15 0 〃 22 6	11 0 〃 12 0	7 0 〃 9 3
1841	16 0 〃 20 0	9 0 〃 11 0	6 0 〃 8 0
1842	14 0 〃 19 0	7 6 〃 8 0	5 6 〃 7 0
1843	not quoted.	4 9 〃 6 6	not quoted.
1844	15 0 to 21 0	6 6 〃 10 0	5 0 to 8 0
1845	14 0 〃 23 0	8 0 〃 12 0	6 0 〃 8 0
1846	13 0 〃 24 0	10 0 〃 13 0	8 0 〃 9 0
1847	20 6 〃 25 0	10 0 〃 14 0	8 6 〃 9 6
1848	20 0 〃 24 0	11 3 〃 12 0	8 6 〃 10 0
1849	not quoted.	not quoted.	7 0 〃 7 6
1850	..	..	7 0 〃 0 0
1851	17 6 to 23 0	9 0 to 12 0	6 6 〃 8 0
1852	18 6 〃 22 0	9 6 〃 12 0	4 6 〃 7 9
1853	23 0 〃 27 0	14 6 〃 16 6	8 0 〃 11 6
1854	20 0 〃 26 0	11 0 〃 16 6	8 0 〃 10 6
1855	23 6 〃 26 6	14 0 〃 16 0	10 0 〃 11 6
1856	17 0 〃 24 0	10 0 〃 20 0	7 6 〃 10 6
1857	20 0 〃 29 0	10 6 〃 15 0	9 3 〃 11 0
1858	20 0 〃 27 6	9 9 〃 18 9	8 3 〃 10 6
1859	20 0 〃 25 0	10 0 〃 14 0	8 9 〃 11 0
1860	21 0 〃 27 3	11 0 〃 16 0	10 0 〃 13 6
1861	21 0 〃 29 0	12 0 〃 22 0	6 3 〃 14 0
1862	16 9 〃 27 0	12 0 〃 18 3	6 0 〃 12 0
1863	20 0 〃 30 6	13 0 〃 16 0	8 0 〃 11 6
1864	25 0 〃 30 0	15 0 〃 19 0	10 0 〃 13 6
1865	15 6 〃 32 6	15 0 〃 25 0	10 0 〃 17 0
1866	31 6 〃 40 0	20 0 〃 36 0	13 6 〃 22 6
1867	20 0 〃 30 6	14 0 〃 22 0	7 6 〃 13 6
1868	20 0 〃 26 0	10 6 〃 18 6	7 0 〃 13 0
1869	22 0 〃 28 0	11 0 〃 14 0	6 9 〃 9 0
1870	27 0 〃 32 6	18 0 〃 22 0	8 0 〃 14 6
1871	23 0 〃 37 0	18 0 〃 23 0	11 0 〃 16 3
1872	31 6 〃 45 0	18 0 〃 32 0	12 6 〃 18 0
1873	28 0 〃 39 0	16 6 〃 27 0	7 0 〃 16 0
1874	25 0 〃 35 0	13 0 〃 20 0	7 0 〃 14 0
1875	26 6 〃 37 6	15 0 〃 21 3	9 6 〃 17 6
1876	30 0 〃 40 0	19 0 〃 24 0	13 0 〃 20 6
1877	35 0 〃 38 9	18 0 〃 25 0	13 6 〃 23 0
1878	30 0 〃 36 0	17 0 〃 23 0	12 0 〃 22 0
1879	25 0 〃 35 9	16 0 〃 24 0	10 6 〃 20 0
1880	25 0 〃 38 0	16 6 〃 22 6	10 0 〃 17 0
1881	30 0 〃 39 0	15 0 〃 23 0	10 0 〃 15 0
1882	33 0 〃 46 0	20 0 〃 28 0	12 6 〃 18 6
1883	36 0 〃 50 6	24 6 〃 33 0	14 0 〃 21 6
1884	29 0 〃 43 6	19 6 〃 28 0	12 0 〃 19 6
1885	24 0 〃 34 0	13 0 〃 22 6	10 0 〃 15 0
1886	25 0 〃 34 0	12 0 〃 22 0	10 6 〃 16 0
1887	22 0 〃 30 0	11 0 〃 19 0	8 0 〃 13 0
1888	22 0 〃 32 0	13 0 〃 24 0	10 0 〃 15 0
1889	26 0 〃 40 0	18 0 〃 29 0	13 0 〃 22 0

TABLE No. 2.—BLACKFACE SHEEP—*Continued.*

Year.	Wethers.					Ewes.					Lambs				
	s.	d.		s.	d.	s.	d.		s.	d.	s.	d.		s.	d.
1890	24	0	to	37	0	14	0	to	27	0	10	6	to	19	0
1891	21	0	"	37	0	10	0	"	24	0	7	6	"	15	0
1892	16	0	"	28	6	6	0	"	17	0	3	0	"	10	0
1893	21	0	"	37	0	12	0	"	24	0	7	0	"	14	0
1894	20	0	"	37	0	14	6	"	26	6	8	6	"	16	6
1895	23	0	"	41	0	16	0	"	28	6	9	0	"	17	0
1896	19	0	"	35	4	13	0	"	24	0	6	0	"	13	6
1897	21	0	"	36	6	15	0	"	25	6	7	0	"	14	6
1898	22	0	"	37	0	16	0	"	26	6	8	0	"	15	0
1899	20	0	"	33	6	13	0	"	24	0	5	6	"	13	0
1900	23	0	"	36	0	16	0	"	26	6	8	0	"	15	6
1901	20	0	"	35	0	14	C	"	25	6	6	6	"	14	6
1902	18	6	"	34	0	12	0	"	24	0	6	0	"	14	0
1903	21	0	"	36	0	15	0	"	28	0	7	0	"	16	6
1904	23	0	"	38	6	18	0	"	30	0	8	6	"	17	6
1905	21	6	"	37	0	19	0	"	31	0	9	0	"	18	6
1906	23	0	"	38	0	20	0	"	33	0	10	0	"	19	6
1907	21	0	"	33	6	17	0	"	28	0	8	6	"	17	6
1908	19	6	"	30	0	15	0	"	24	6	8	0	"	16	0
1909	17	0	"	28	0	11	6	"	22	0	6	3	"	13	0
1910	21	0	"	32	6	16	0	"	27	6	8	0	"	17	0
1911	19	0	"	29	6	14	0	"	24	0	7	0	"	15	0
1912	21	6	"	32	6	17	0	"	27	6	9	6	"	17	6
1913	24	6	"	36	0	21	0	"	31	0	12	6	"	21	6
1914	27	0	"	38	6	25	0	"	34	6	15	6	"	24	0
1915	31	0	"	42	6	29	0	"	39	6	17	0	"	25	6
1916	33	0	"	46	6	31	0	"	42	0	19	0	"	27	6
1917	36	0	"	51	0	33	0	"	47	0	21	0	"	30	0
1918	41	0	"	56	0	36	0	"	50	0	27	0	"	33	0
1919	44	0	"	62	0	39	0	"	54	0	29	0	"	36	0
1920	46	0	"	86	0	44	0	"	62	0	31	0	"	43	0
1921	32	9	"	60	9	35	3	"	62	6	20	3	"	47	0
1922	40	3	"	63	0	40	6	"	74	0	18	0	"	44	0
1923	46	0	"	65	6	43	0	"	78	0	21	0	"	45	6
1924	46	0	"	68	6	45	6	"	85	0	25	0	"	55	6
1925	36	0	"	60	0	40	0	"	78	0	17	6	"	44	0

Year.	Wethers.					Ewes.					Lambs.									
											Wether.					Ewe.				
	s.	d.		s.	d.	s.	d.		s.	d.	s.	d.		s.	d.	s	d.		s	d.
1926	30	9	to	54	0	31	0	to	70	0	21	9	to	49	0	19	0	to	50	0
1927	26	6	"	48	0	26	0	"	64	0	17	9	"	40	0	17	6	"	37	9
1928	28	0	"	45	9	24	0	"	57	0	16	6	"	38	6	17	0	"	38	9
1929	29	9	"	46	0	29	0	"	64	0	20	9	"	43	0	18	0	"	37	6
1930	31	6	"	45	0	28	6	"	60	0	20	0	"	45	9	20	0	"	37	6
1931	19	6	"	29	9	15	0	"	36	0	14	3	"	36	9	16	6	"	40	6
1932	12	0	"	19	6	15	0	"	29	0	7	3	"	13	6	7	0	"	14	6
1933			.			20	0	"	34	0	12	9	"	19	3	11	0	"	18	3
1934			.			22	6	"	44	0	16	0	"	25	3	16	6	"	24	3
1935						26	0	"	40	0	16	0	"	26	9	10	0	"	23	0
1936			..			27	6	"	48	0	18	6	"	37	6	16	0	"	29	0
1937			.			32	0	"	54	0	22	6	"	39	3	21	6	"	34	0

TABLE No. 3.—PRICE OF WOOL, PER STONE OF 24 LB., SINCE 1818.

Year.	Laid Cheviot.	White Cheviot.	Laid Highland	White Highland.
	s. d. s. d.	s. d. s. d.	s d s d	s. d. s d.
1818	40 0 to 42 2	..	20 0 to 22 6	..
1819	21 0 ″ 22 0	..	10 0 ″ 10 3	..
1820	20 0 ″ 22 0	..	9 0 ″ 10 0	..
1821	18 0 ″ 20 0	..	9 0 ″ 10 0	..
1822	12 6 ″ 14 6	.	5 0 ″ 6 6	..
1823	9 0 ″ 10 6	..	5 0 ″ 5 9	..
1824	13 6 ″ 15 0	..	6 0 ″ 6 3	..
1825	10 6 ″ 22 0	..	10 0 ″ 10 6	..
1826	11 0 ″ 14 0	.	5 0 ″ 5 6	..
1827	11 0 ″ 14 9	..	5 6 ″ 6 9	..
1828	8 0 ″ 11 0	..	5 6 ″ 6 0	..
1829	8 6 ″ 11 0	..	4 3 ″ 0 0	..
1830	9 6 ″ 11 0	..	4 6 ″ 5 0	..
1831	17 0 ″ 20 0		7 6 ″ 8 6	..
1832	14 0 ″ 16 0		7 0 ″ 7 6	..
1833	18 0 ″ 20 7	..	10 0 ″ 11 0	..
1834	21 0 ″ 24 6	..	5 6 ″ 7 0	..
1835	19 0 ″ 20 6	..	9 6 ″ 10 8	..
1836	21 0 ″ 25 0	..	10 0 ″ 14 0	..
1837	12 0 ″ 14 0	..	7 0 ″ 7 8	—
1838	19 0 ″ 22 6	..	6 0 ″ 10 0	..
1839	18 0 ″ 20 0	.	8 0 ″ 12 0	..
1840	15 0 ″ 0 0	..	7 0 ″ 0 0	..
1841	15 0 ″ 16 9	.	6 0 ″ 7 5	..
1842	12 6 ″ 14 0	.	not quoted.	..
1843	9 0 ″ 11 6	..	5 0 to 6 0	..
1844	15 0 ″ 18 0	.	not quoted.	.
1845	14 6 ″ 17 6	..	7 6 to 8 6	..
1846	12 0 ″ 14 6	..	8 0 ″ 8 6	..
1847	12 6 ″ 14 0		not quoted	..
1848	9 6 ″ 11 0	..	4 9 to 0 0	..
1849	12 0 ″ 16 6	..	6 0 ″ 6 3	..
1850	15 0 ″ 17 6	..	8 0 ″ 8 6	..
1851	12 0 ″ 16 0	..	8 0 ″ 9 3	..
1852	13 0 ″ 15 0	..	8 0 ″ 9 0	..
1853	19 0 ″ 22 0	..	11 0 ″ 12 6	..
1854	12 0 ″ 15 0	..	7 6 ″ 8 6	..
1855	14 6 ″ 19 0	..	8 6 ″ 9 0	..
1856	19 0 ″ 21 6	..	11 0 ″ 0 0	..
1857	19 0 ″ 24 0	..	13 0 ″ 14 3	.
1858	15 0 ″ 17 0	..	8 9 ″ 10 0	..
1859	18 6 ″ 24 0	..	10 9 ″ 11 6	..
1860	22 0 ″ 32 0	37 0 to 38 0	10 0 ″ 11 3	..
1861	19 6 ″ 27 0	from 30s. upwards	not quoted.	—
1862	18 6 ″ 26 0	30 0 to 37 0	11 6 to 16 0	..
1863	25 6 ″ 31 0	33 0 ″ 42 0	15 3 ″ 17 6	..
1864	31 0 ″ 39 0	47 0 ″ 54 0	17 6 ″ 20 0	..
1865	23 0 ″ 30 0	44 0 ″ 45 0	15 0 ″ 17 6	..
1866	24 0 ″ 30 0	30 0 ″ 33 0	14 0 ″ 16 0	..
1867	16 0 ″ 21 6	not quoted.	not quoted.	..
1868	19 0 ″ 26 0	28 0 to 32 6	8 6 to 9 0	..
1869	18 0 ″ 26 6	not quoted.	8 6 ″ 10 0	..
1870	15 0 ″ 23 6	25 0 to 26 0	9 6 ″ 0 0	..
1871	20 0 ″ 26 6	30 0 ″ 34 6	12 0 ″ 15 0	..
1872	26 0 ″ 37 6	40 0 ″ 48 0	18 0 ″ 21 0	..
1873	17 0 ″ 18 0	34 0 ″ 40 0	9 0 ″ 12 0	..
1874	18 6 ″ 26 6	30 0 ″ 34 0	9 6 ″ 13 0	..
1875	25 0 ″ 32 0	34 6 ″ 36 0	12 6 ″ 16 0	..
1876	20 0 ″ 24 0	30 0 ″ 34 6	9 6 ″ 12 0	..
1877	20 9 ″ 26 0	28 0 ″ 30 0	10 0 ″ 12 0	..
1878	18 9 ″ 25 0	27 0 ″ 32 0	8 6 ″ 11 6	..
1879	15 0 ″ 17 0	prices very low.	7 0 ″ 0 0	..
1880	20 0 ″ 24 0	30 0 to 32 0	10 6 ″ 11 6	14 0 to 15 0
1881	17 0 ″ 21 0	27 0 ″ 30 0	5 0 ″ 9 6	12 0 ″ 13 0
1882	14 0 ″ 18 0	27 6 ″ 28 0	7 6 ″ 9 0	13 0 ″ 14 0
1883	13 0 ″ 18 0	26 0 ″ 28 0	6 6 ″ 8 6	11 6 ″ 12 6
1884	13 0 ″ 18 0	26 0 ″ 28 0	6 6 ″ 8 6	11 6 ″ 12 6
1885	12 0 ″ 17 0	22 6 ″ 25 0	6 0 ″ 8 0	11 6 ″ 12 0
1886	13 0 ″ 18 0	23 0 ″ 27 6	6 6 ″ 8 6	11 6 ″ 12 0
1887	14 0 ″ 22 0	23 0 ″ 28 0	7 0 ″ 9 0	11 6 ″ 13 0
1888	13 0 ″ 20 0	23 0 ″ 28 0	7 0 ″ 9 0	11 6 ″ 12 6

TABLE No. 3.—PRICE OF WOOL—*Continued.*

Year.	Laid Cheviot.					White Cheviot.					Laid Highland.					White Highland.				
	s.	d		s.	d	s.	d		s	d.	s	d		s.	d.	s	d.		s.	d
1889	13	0	to	18	0	24	0	to	28	0	7	0	to	9	0	11	0	to	12	6
1890	13	0	"	18	0	24	0	"	28	0	7	0	"	9	0	11	0	"	12	6
1891	12	6	"	18	0	22	0	"	28	0	7	0	"	9	0	11	0	"	12	6
1892	12	0	"	18	0	20	0	"	28	0	7	0	"	8	6	10	6	"	12	0
1893	12	0	"	17	0	20	0	"	27	0	7	0	"	8	0	10	0	"	12	0
1894	12	0	"	16	0	20	0	"	26	0	7	0	"	8	0	10	0	"	12	0
1895	12	0	"	16	0	20	0	"	25	0	7	0	"	8	0	10	0	"	11	6
1896	11	0	"	15	0	19	0	"	24	0	7	0	"	8	0	10	0	"	11	6
1897	11	0	"	14	0	18	0	"	23	0	7	0	"	8	0	10	6	"	12	0
1898	10	0	"	13	0	16	0	"	20	0	7	0	"	8	0	10	0	"	11	6
1899	10	0	"	13	6	13	0	"	18	6	7	0	"	8	0	8	6	"	9	6
1900	9	9	"	12	0	13	0	"	18	6	6	9	"	7	9	8	0	"	9	6
1901	9	0	"	10	0	11	0	"	16	6	5	9	"	6	6	8	0	"	9	0
1902	9	0	"	10	0	11	6	"	17	0	6	0	"	6	6	8	6	"	9	6
1903	10	0	"	12	0	15	0	"	18	0	7	0	"	8	0	11	6	"	12	6
1904	15	0	"	17	0	20	0	"	21	0	9	0	"	10	0	14	0	"	15	0
1905	17	0	"	20	0	24	0	"	26	0	10	0	"	11	0	15	0	"	16	0
1906	18	0	"	21	0	27	0	"	28	6	11	6	"	13	0	16	6	"	17	6
1907			*			22	0	"	24	0	11	0	"	12	6	16	0	"	17	0
1908			*			16	0	"	18	0			†			8	0	"	8	6
1909			*			24	0	"	26	0			†			12	6	"	14	0
1910			*			25	0	"	30	0			†			13	0	"	14	6
1911			*			25	0	"	30	0			†			13	0	"	14	6
1912			*			24	0	"	29	0			†			14	0	"	15	0
1913			*			25	0	"	30	0			†			17	0	"	18	0
1914			*			24	0	"	29	0			†			15	0	"	15	6
1915‡			*			42	0	"	46	0			†			21	0	"	22	0

* No Cheviots smeared now † No Highlands smeared now ‡ These are July prices.

PRICE OF WOOL PER STONE OF 24 LB.—*Continued.*

		CHEVIOT.				HALF-BRED.				BLACK-FACE.		CROSS-BRED (BLACKFACE EWE AND LEICESTER RAM).			
		Hogg.		Ewe and Wether.		Hogg.		Ewe and Wether.		Hogg	Ewe and Wether.	Hogg.		Ewe and Wether.	
		Washed.	Un-washed.	Washed.	Un-washed.	Washed.	Un-washed.	Washed.	Un-washed.			Washed.	Un-washed.	Washed.	Un-washed.
		s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
[1] 1916	. . .	36 6	30 0	33 0	27 6	34 6	23 6	33 0	27 6	23 0	23 0	28 6	25 6	28 6	25 6
	CAITHNESS & SUTHERLAND	40 0	32 6	34 0	29 0	35 0	29 0	34 0	28 6						
[1] 1917	. . .	40 6	33 0	37 0	31 0	38 6	31 6	37 0	31 0	25 6	25 6	31 6	28 6	31 6	28 6
	CAITHNESS & SUTHERLAND	44 6	36 0	37 6	32 6	39 0	32 6	37 6	31 6						
[1] 1918	. . .	43 6	35 6	39 6	33 0	41 0	33 6	39 6	33 0	27 0	27 0	33 6	30 6	33 6	30 6
	CAITHNESS & SUTHERLAND	47 6	38 6	40 0	34 6	41 6	34 6	40 0	33 6						
1919	. . .	84 0	70 0	82 0	66 0	82 0	62 0	70 0	58 0	34 0	34 0	46 0	39 0	44 0	38 0
	CAITHNESS & SUTHERLAND	88 0	74 0	84 0	68 0	84 0	68 0	72 0	60 0						
1920	. . .	86 0	70 0	83 0	66 0	74 0	54 0	65 0	50 0	24 0	24 0	35 0	29 0	34 0	27 0
	CAITHNESS & SUTHERLAND	90 0	74 0	87 0	68 0	76 0	56 0	68 0	52 0						
1921	. . .	22 0	17 0	19 0	15 0	18 6	14 6	16 0	13 0	9 6	9 6	12 0	10 0	12 0	10 0
	CAITHNESS & SUTHERLAND	28 0	18 0	20 0	16 0	19 6	15 6	17 0	14 0						
1922	. . .	30 0	25 0	26 0	22 0	26 0	20 0	22 0	18 0	16 0	16 0	16 6	15 0	16 6	15 0
	CAITHNESS & SUTHERLAND	31 6	26 0	27 0	23 0	27 0	21 0	23 0	19 0						
1923	. . .	41 0	34 0	36 0	30 0	33 0	27 0	30 0	25 0	17 6	17 6	20 0	18 0	20 0	18 0
	CAITHNESS & SUTHERLAND	43 0	35 0	37 0	31 0	34 0	28 0	31 0	26 0						
1924	. . .	58 0	49 0	53 6	45 0	49 0	40 0	45 0	39 0	25 6	25 6	34 6	30 6	33 0	30 0
	CAITHNESS & SUTHERLAND	60 0	50 0	54 0	46 0	50 0	41 0	46 0	40 0						
1925	. . .	39 0	34 0	36 0	30 0	33 6	28 6	32 0	27 0	25 6	25 6	26 0	23 6	25 6	23 0
	CAITHNESS & SUTHERLAND	40 0	35 0	37 0	31 0	34 0	29 0	33 0	28 0						
1926	. . .	35 0	29 0	32 0	28 0	32 0	26 6	28 0	24 6	19 0	19 0	22 6	20 0	22 0	19 6
	CAITHNESS & SUTHERLAND	36 0	30 0	33 0	29 0	33 0	27 6	29 0	25 6						
1927	. . .	38 0	31 0	35 0	31 0	34 6	29 6	32 0	27 6	24 0	24 0	27 0	25 6	27 0	25 0
	CAITHNESS & SUTHERLAND	39 0	32 0	36 0	32 0	35 0	30 0	33 0	28 6						
1928	. . .	51 0	43 0	48 0	41 0	47 0	40 0	43 0	37 0	24 6	24 6	33 0	31 0	32 0	30 0
	CAITHNESS & SUTHERLAND	52 0	44 6	49 0	42 0	48 0	41 0	44 0	38 0						
1929	. . .	37 0	32 0	34 0	29 0	34 0	29 0	32 0	27 0	24 0	24 0	27 0	25 0	26 0	24 0
1930	. . .	23 0	19 0	22 0	18 0	21 0	17 6	20 0	16 6	12 0	12 0	17 6	15 6	16 6	15 6
1931	. . .	16 6	13 6	15 6	13 0	15 0	13 0	13 6	11 6	11 0	11 0	12 0	10 6	11 6	10 0
1932	. . .	14 6	11 6	14 0	11 6	12 6	11 6	11 6	9 6	8 0	8 0	9 0	8 6	8 0	7 6
1933	. . .	20 0	17 0	19 0	16 0	18 0	16 0	17 0	14 0	11 6	11 6	12 0	11 0	11 6	11 0
1934	. . .	21 6	17 6	21 0	17 0	19 0	17 0	17 0	14 0	10 0	10 0	12 0	11 0	12 0	11 0
1935	. . .	26 0	21 0	24 6	19 6	21 6	19 0	19 0	17 0	10 6	10 6	14 0	12 6	14 0	12 6
1936	. . .	27 0	22 0	25 6	20 0	21 6	19 0	19 0	17 0	14 0	14 0	17 0	16 6	17 0	16 0
1937	. . .	39 0	35 0	38 0	33 6	34 6	32 0	34 6	31 6	26 0	26 0	32 0	29 6	32 0	29 0

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[1] The prices given were prices fixed by Government, and not free market prices.

GENERAL SHOW AT ALLOA, 1937.

The Society's One hundred and sixth Show was held at Alloa on Tuesday, 22nd June, and three following days. This was the tenth Show to be held in the Stirling Show Division. Of these, the immediately preceding Show, in 1929, was held at Alloa, whilst the previous Shows in the Division were held at Stirling.

The Show was held, as on the former occasion, in Alloa Park, which was placed at the disposal of the Town Council of Alloa and of the Society through the courtesy of the President, the Earl of Mar and Kellie, K.T. This site was undoubtedly one of the finest which the Show has occupied. It was level, covered with good turf, and studded with trees, which formed an ideal background to the Show buildings and greatly enhanced the general effect.

The Town Council of Alloa gave a supply of water free of charge, this being led, at considerable expense, to a convenient point within the ground. They also gave an excellent service of gas, this being led to all Stands where it was required, and the necessary appliances provided free of charge, the only cost to the consumer being the price of the gas consumed. The Town Council and Town Officials did everything in their power to further the success of the Show.

With regard to entries, Cattle showed a slight increase in numbers as compared with the Show at Melrose in 1936, and also as compared with the previous Show at Alloa. Horses were slightly down compared with Melrose, but the difference was more than accounted for by the very large entry of Hunters at the Melrose Show. Sheep also were fewer than at Melrose, but practically the same as at Alloa in 1929. Goats were fewer, but Pigs showed a gratifying increase. Entries in other sections were well maintained, the Live Stock Judging Competition having attracted 161 Competitors, which was about the maximum number which could be arranged for in one day. The entries of Implements, Machinery, and Trade Exhibits were above the average, being approximately 1000 feet of Stand frontage in excess of the large entry at Melrose in the preceding year.

The Flower Show was on the same extensive scale as formerly. Many of the best known nurserymen staged exhibits of outstanding merit, and these were a source of great interest to many visitors.

Full-dress Musical Rides and Trick Riding Displays by the 4th/7th Royal Dragoon Guards, and Sheep Dog Demonstrations, were again provided on the Wednesday, Thursday, and Friday. A new item of interest was a Physical Training Display by the Argyll and Sutherland Highlanders. The usual Jumping Competitions attracted a very large entry.

The Show was held under ideal conditions in so far as weather was concerned, and the attendance of the public was most gratifying. The total number who paid for admission during the four days was 66,332, which compared with 57,075 at the previous Alloa Show.

Altogether the Show was a most successful one, and the Directors have pleasure in reporting that the Accounts show a credit balance of £4001.

STATISTICS.

The following tables give the number of entries in the various sections:—

CATTLE.

SHORTHORN.	No. of Entries.	
1. Aged bulls	7	
2. Two-year-old bulls	6	
3. One-year-old bulls	6	
4. One-year-old bulls	8	
5. Cows in milk, born before 1st December 1933	4	
Extra stock	1	
6. Three-year-old cows	3	
7. Two-year-old cows or heifers	4	
8. One-year-old heifers	9	
9. One-year-old heifers	4	
	—	52

Aberdeen-Angus.

10. Aged bulls	6	
11. Two-year-old bulls	8	
12. One-year-old bulls	11	
13. One-year-old bulls	15	
14. Cows in milk, born before 1st December 1933	9	
15. Three-year-old cows in milk	7	
16. Two-year-old cows or heifers	12	
17. One-year-old heifers	27	
18. One-year-old heifers	13	
	—	108

Galloway.

19. Aged bulls	5	
20. Two-year-old bulls	3	
21. One-year-old bulls	2	
22. Cows in milk, born before 1st December 1934	7	
23. Two-year-old cows or heifers	15	
24. One-year-old heifers	17	
	—	49

Belted Galloway.

25. Bulls born before 1st December 1935	2	
26. Bulls born on or after 1st December 1935	4	
27. Cows or heifers, born before 1st December 1934, in milk or in calf	5	
28. Heifers born on or after 1st December 1934 and before 1st December 1935	5	
29. Heifers born on or after 1st December 1935	4	
	—	20

Highland.

30. Aged bulls	1	
Extra Stock	1	
31. Two-year-old bulls	4	
32. One-year-old bulls	6	
33. Cows of any age, with calf at foot	7	
34. Three-year-old heifers	10	
35. Two-year-old heifers	12	
36. One-year-old heifers	9	
	—	50

Ayrshire.

37. Cows in milk, born before 1934	8	
Extra Stock	1	
38. Cows in milk, born on or after 1st January 1934	11	
39. Cows of any age, in calf	7	
40. Heifers born on or after 1st June 1934, in calf	11	
41. Heifers born in 1935	8	
42. Heifers born in 1936	10	
43. Bulls born before 1935	4	
44. Bulls born in 1935	3	
45. Bulls born in 1936	3	
	—	66

BRITISH FRIESIAN.

46.	Cows in milk, born in or before 1933	8	
47.	Cows in calf and not in milk, born in or before 1933	3	
	Extra Stock	1	
48.	Cows in milk, born in 1934 or 1935	10	
49.	Heifers born in 1935	12	
50.	Heifers born in 1936, before 1st July	11	
51.	Heifers born in 1936, on or after 1st July	8	
52.	Bulls born in or before 1934	5	
53	Bulls born in 1935	4	
54.	Bulls born in 1936	5	
		—	67
			412

HORSES.

CLYDESDALE STALLIONS AND COLTS.

55.	Aged stallions	6	
56	Three-year-old entire colts	7	
57.	Two-year-old entire colts	16	
58.	One-year-old entire colts	17	
		—	46

CLYDESDALE GELDINGS.

59.	Aged geldings	8	
60.	Three-year-old geldings	10	
61.	Two-year-old geldings	4	
		—	22

CLYDESDALE MARES AND FILLIES.

62.	Mares of any age, with foal at foot, or due to foal before 31st July 1937	11	
63.	Yeld mares, born before 1934	4	
	Extra Stock	1	
64.	Three-year-old yeld mares or fillies	9	
65.	Two-year-old fillies	18	
66.	One-year-old fillies	22	
		—	65

SUFFOLKS.

(For Exhibition only)	2

HUNTERS.

67.	Hunter brood mares, with foal at foot, or due to foal before 31st July 1937	3	
68.	Yeld mares, fillies, or geldings, born in 1934, in hand	4	
69.	Yeld mares, fillies, or geldings, born in 1935, in hand	7	
70.	Fillies, colts, or geldings, born in 1936, in hand	7	
71.	Mares or geldings, born before 1933, to carry 14 stone and over, in saddle	6	
72.	Mares or geldings, born before 1933, to carry under 14 stone, in saddle	19	
73.	Mares or geldings, born in 1933, in saddle	8	
74.	Hacks of hunter type, born in or before 1933, not exceeding 15.2 hands, in saddle	7	
		—	61

RIDING PONIES.

75.	Mares or geldings, any age, over 13.2 hands and not exceeding 14.2 hands, in saddle	8	
76.	Mares or geldings, any age, over 12 hands and not exceeding 13.2 hands, in saddle	2	
77.	Mares or geldings, any age, not exceeding 12 hands, in saddle	7	
		—	17

HIGHLAND AND WESTERN ISLAND PONIES.

78.	Stallions, born before 1935, not exceeding 14.2 hands	4	
	Extra Stock	1	
79.	Entire colts, born on or after 1st January 1935, not exceeding 14.2 hands	7	
80.	Mares, any age, not exceeding 14.2 hands, with foal at foot, or due to foal before 31st July 1937	6	
81.	Yeld mares or fillies, born before 1935, not exceeding 14.2 hands	8	
	Extra Stock	1	
82.	Fillies, born on or after 1st January 1935, not exceeding 14.2 hands	8	
		—	35

SHETLAND PONIES.

83.	Stallions, not exceeding 10½ hands, born before 1934	5	
	Extra Stock	1	
84.	Entire colts, not exceeding 10½ hands, born in 1934 or 1935	5	
85.	Mares, not exceeding 10½ hands, with foal at foot, or due to foal before 31st July 1937	7	
86.	Yeld mares, not exceeding 10½ hands	6	
87.	Fillies, not exceeding 10½ hands, born in 1934 or 1935	5	
		—	29

HACKNEYS IN HARNESS.

88	Stallions, mares, fillies, or geldings, any age, in harness, exceeding 14 hands	7	
	Extra Stock	1	
89.	Stallions, mares, fillies, or geldings, any age, in harness, 14 hands and under	5	
		—	13
			290

DRAUGHT GELDINGS IN HARNESS.

90. Draught geldings, any age, in harness, shown in cart or lorry (and driven by single driver). } Cancelled owing to insufficient entries—(Regulation 12).

JUMPING.

1.	Horses or ponies, any height	35	
2.	Horses or ponies, any height—Confined to competitors permanently resident in Scotland	23	
3.	Horses or ponies, any height—handicap	38	
4.	Horses or ponies, any height	36	
5.	Horses or ponies, any height—handicap	34	
		—	166

SHEEP.

BLACKFACE.

91.	Tups, three shear and over	18	
92.	Tups, two shear	19	
93.	Shearling tups	45	
94.	Tup lambs	25	
95.	Ewes above one shear, with lamb at foot	12	
96.	Shearling ewes or gimmers	20	
97.	Ewe lambs	16	
		—	155

CHEVIOT.

98.	Tups above one shear	7	
99.	Shearling tups	9	
100.	Tup lambs	8	
101.	Ewes above one shear, with lamb at foot	6	
102.	Shearling ewes or gimmers	8	
103.	Ewe lambs	6	
		—	44

BORDER LEICESTER.

104.	Tups above one shear	6	
105.	Shearling tups	20	
106.	Tup lambs	25	
107.	Ewes above one shear	12	
108.	Shearling ewes or gimmers	19	
109.	Ewe lambs	14	
		—	96

HALF-BRED.

110.	Shearling tups	2	
111.	Ewes above one shear	4	
112.	Shearling ewes or gimmers	4	
113.	Ewe lambs	2	
		—	12

OXFORD DOWN.

114.	Shearling tups	11	
115.	Shearling ewes or gimmers	7	
116.	Tup lambs	7	
117.	Ewe lambs	7	
		—	32

SUFFOLK.

118.	Tups, one shear and over	8	
119.	Shearling ewes or gimmers	13	
120.	Tup lambs	18	
121.	Ewe lambs	18	
		—	57
			396

GOATS.

122.	Female goats, Toggenburg, British Toggenburg, or British Alpine, in milk, any age	5	
123.	Female goats, Saanen, or British Saanen, in milk, any age	1	
	Extra Stock	1	
124.	Female goats, any other variety, in milk, any age	2	
	Extra Stock	1	
125.	Goatlings, Toggenburg, British Toggenburg, or British Alpine, over one but not exceeding two years	3	
126.	Goatlings, any other variety, over one but not exceeding two years	5	
127.	Female kids, any variety, not exceeding one year	6	
128.	Male kids, any variety, not exceeding one year	1	
		—	25

MILKING COMPETITIONS.

129.	For quality, open to Classes 122, 123, and 124 (7 entries)	...	
130.	For quantity, open to Classes 122, 123, and 124 (7 entries)	...	
		—	...
			25

PIGS.

Large White.

131.	Boars born before 1936	12	
132.	Boars born in 1936 before 1st July	5	
133.	Boars born in 1936 on or after 1st July	15	
134.	Boars born in 1937	15	
135.	Sows born before 1936	15	
	Extra Stock	1	
136.	Sows born in 1936 before 1st July	15	
137.	Sows born in 1936 on or after 1st July	18	
138.	Sows born in 1937	20	
			116

Large Black.

139.	Boars born before 1937	4	
140.	Boars born in 1937	3	
141.	Sows born before 1936	4	
142.	Sows born in 1936	5	
143.	Sows born in 1937	3	
			19
			135

POULTRY.

1–118.	551

DAIRY PRODUCE.

1–4.	33

HONEY, &c.

1–21.	136

RURAL INDUSTRIES.

1–26.	357

BUTTERMAKING.

Class 1 (Open)	50

HORSE-SHOE MAKING.

Class 1 (Open)	38

HORSE-SHOEING.

Class 1 (Open)	42

LIVE STOCK JUDGING.

Open to persons 18 to 23 years of age	161

SUMMARY.

1. Cattle	412
2. Horses	290
3. Jumping	166
4. Sheep	396
5. Goats	25
6. Pigs	135
7. Poultry	551
8. Dairy Produce	33
9. Honey, &c.	136
10. Rural Industries	357
11. Buttermaking	50
12. Horse-Shoe Making	38
13. Horse-Shoeing	42
14. Live Stock Judging	161
	2792

The following table gives a comparative view of the entries of cattle, horses, sheep, goats, pigs, poultry, rabbits, honey, dairy produce, wool, rural industries, &c., and implements, of the value of the premiums offered, and of the receipts at the entrance-gates, grand stands, and for catalogues at the Shows which have been held in the Stirling Show Division :—

Year.	Cattle.	Horses.	Sheep.	Goats.	Pigs.	Poultry.	Rabbits.	Honey, &c.	Dairy Produce.	Wool.	Rural Industries.	Horse-Shoeing.	Live Stock Judging.	Implements.	Premiums.	Drawings at Show.
1833	288	68	60	..	40	..	..	..	..	..	..	..	..	22	£553	£211
1864	397	181	262	..	50	84	..	..	..	..	..	..	..	973	1350	1,729
1873	406	297	278	..	62	387	..	..	..	..	..	..	..	1400	1860	3,140
1881	336	215	211	..	29	294	..	..	..	..	..	..	..	2001	2340	2,577
1891	318	252	210	..	41	317	..	..	65	..	..	..	..	1568	2114	2,930
1900	321	288	369	..	28	457	..	..	66	24	..	..	..	2095	2895	4,305
1909	330	355	249	..	54	539	..	..	49	..	..	..	..	1977	3017	4,638
1921	367	279	299	59	188	582	..	66	66	56	..	..	..	2201	5055	12,764
1929	399	322	403	33	132	561	102	150	48	79	309	73	160	2414	6256	9,470
1937	412	290	396	25	135	551	..	136	33	..	357	80	161	2638	6667	11,457

A COMPARISON.

The following figures relating to some of the most successful Shows the Society has held will be perused with interest :—

[TABLE.

	Cattle.	Horses.	Sheep.	Goats.	Pigs.	Poultry.	Rabbits.	Total Live Stock.	Implements.	Premiums.	Drawings at Show.	Profit.
Glasgow, 1867 .	286	212	257	..	58	150	..	963	1344	£1600	£3,005	£1307
Edinburgh, 1869	310	212	340	..	22	239	..	1123	1900	1600	4,078	2067
Glasgow, 1875 .	411	405	296	..	48	479	..	1639	2220	2665	6,231	3316
Edinburgh, 1877	339	342	305	..	30	234	..	1250	2292	2714	6,734	3710
Edinburgh, 1884	580	453	493	..	35	253	..	1814	2282	4343	6,548	1855
Edinburgh, 1893	380	349	294	..	31	360	..	1414	2268	2600	4,918	2323
Aberdeen, 1894 .	314	324	184	..	34	365	..	1221	2532	2440	5,121	1678
Perth, 1896 .	292	258	204	..	20	374	.	1148	1945	2205	4,788	2511
Glasgow, 1897 .	317	350	245	..	30	275	..	1217	2227	2397	4,392	2021
Edinburgh, 1899	386	518	477	..	46	551	..	1978	2585	3844	10,285	3911
Stirling, 1900 .	321	288	369	..	28	457	..	1463	2095	2915	4,305	1078
Inverness, 1901 .	360	257	204	..	22	499	..	1340	1460	2806	2,485	99
Aberdeen, 1902 .	330	253	243	..	42	475	..	1343	1938	2796	4,413	1604
Perth, 1904 .	348	315	283	..	35	413	..	1394	1972	3058	4,993	1328
Glasgow, 1905 .	310	462	284	..	60	534	..	1750	1875	3702	4,473	1208
Peebles, 1906 .	253	258	291	..	40	438	..	1280	1658	3072	2,596	416
Edinburgh, 1907	363	464	352	..	58	605	..	1842	2140	3614	7,061	2309
Aberdeen, 1908 .	331	299	237	..	42	509	..	1418	1931	3045	4,596	1331
Stirling, 1909 .	330	355	249	..	54	539	..	1527	1977	3017	4,683	1100
Dumfries, 1910 .	270	355	295	..	54	481	..	1455	1950	3037	3,411	562
Paisley, 1912 .	408	472	334	..	48	536	..	1798	1968	5109	6,463	2527
Edinburgh, 1919	215	301	221	60	43	398	..	1238	1605	4517	17,377	3275
Aberdeen, 1920 .	340	250	279	19	112	597	..	1597	2065	4608	14,120	1679
Stirling, 1921 .	367	279	299	59	188	582	..	1774	2201	5055	12,822	2350
Dumfries, 1922 .	422	272	339	41	229	588	..	1891	2156	5488	11,428	1090
Perth, 1924 .	406	283	366	21	202	760	..	2038	2382	5712	10,758	2311
Glasgow, 1925 .	461	340	349	31	178	577	178	2114	2570	6136	12,865	4226
Kelso, 1926 .	430	284	597	31	159	546	108	2155	2366	6004	9,218	324
Edinburgh, 1927	462	357	493	63	201	724	184	2484	2374	6049	12,315	2090
Aberdeen, 1928 .	421	277	349	25	80	578	120	1850	2377	6131	11,031	1882
Edinburgh, 1931	635	389	684	47	117	644	125	2641	2991	9608	12,478	704
Dundee, 1933 .	443	256	396	22	75	491	89	1772	2471	6979	12,698	4813
Glasgow, 1934 .	507	287	356	27	155	532	85	1949	2832	7034	13,535	3534
Aberdeen, 1935 .	464	230	386	20	230	500	..	1830	2778	6940	11,372	645
Melrose, 1936 .	410	303	531	29	132	454	..	1859	2536	7188	12,066	169
Alloa, 1937 .	412	290	396	25	135	551	..	1809	2638	6667	11,457	4002

CATTLE.

The number of Cattle entered showed a small advance over the previous Alloa Show with a total of 412.

The entries of Shorthorns were not large, 52 in all, but were well distributed over the Classes. Captain John MacGillivray, of Calrossie, Nigg, Ross-shire, both as exhibitor and breeder, carried off a large share of the honours. He took first place for aged bulls with "Calrossie Control," 255,913 (Fig. 47), his well-known white stock bull, which was champion at Perth Shorthorn Sale as a yearling, and had not been shown since. Born in 1932, he was bred by the exhibitor, his sire being "Collynie Royal Leader," 188,656, and dam "Calrossie Princess Mona," 88,108. The bull was shown in wonderful form, and secured the principal breed awards, including the President's Champion Medal, Edinburgh Corporation Perpetual Gold Challenge Cup, the Duthie Perpetual Challenge Cup, Tweeddale Gold Medal, and the Shorthorn Society's Prize of £20. Reserve for the championship was Mr R. Wemyss Honeyman's "Calrossie Silver Wedding," 275,443, a white two-year-old bull, bred by Captain John

MacGillivray. Messrs J. Baird & Co. (Falkirk) Ltd., the donors of the Emilio R. Casares Junior Memorial Cup, won this trophy with a good-looking red roan junior yearling, "Royal Pride," bred by Mr K. P. MacGillivray, Kirkton, Bunchrew, and sired by the winner of the championship. Mr W. M'Nair Snadden, of The Coldoch, Blair Drummond, secured the Silver Cup presented by himself for the best group of three shorthorns, his team being "Balthayock Grand National," a yearling roan bull, a yearling red roan heifer, "Coldoch Beauty 2nd," and a red yearling heifer, "Lavender Lady." The Shorthorn Society's Prize of £20 for the best female was awarded to Mr R. Laidlaw Smith, Pittodrie, Pitcaple, Aberdeenshire, for "Calrossie Blyth Pam," 130,739, bred by the owner of the champion animal, a first-prize winner at Melrose, shown on this occasion as Extra Stock.

There was again an excellent exhibition of Aberdeen-Angus Cattle, 108 entries having been received, 30 in excess of those entered at Alloa in 1929. The all-round quality was good, with outstanding animals to top most of the Classes. It was a noteworthy feature that exhibitors from Northumberland were more than usually successful. For yet another year the supreme Championship of the breed went to a female, Captain A. L. Goodson, Kilham, Mindrum, Northumberland, securing the award with "Eulima 6th of Kilham," 102,652 (Fig. 48), a fitting successor to Mr J. E. Kerr's "Julie Erica," Champion for the last three years. Of Captain Goodson's own breeding, this magnificent four-year-old cow was sired by "Pelorus of Bywell," 78,476, out of "Eulima 81st," 78,959. She was a first-prize winner at Melrose in 1936, and had gained distinctions at other Shows. Shown in beautiful condition, her sprightly style attracted much attention in the Parade Ring. Her other awards included the "Angus" Perpetual Challenge Cup for the best Aberdeen-Angus animal; the Falconer L. Wallace Silver Cup for the best female; and the Aberdeen-Angus Cattle Society's Gold Medal for the best animal in the breeding classes. Along with two other home-bred animals she won for her owner the Silver Cup for the Best Group gifted by Mr J. E. Kerr of Harviestoun. Captain F. B. Atkinson gained the Reserve Championship with "Elver of Gallowhill," 87,177, a three-year-old home-bred bull, which also won the Ballindalloch Cup for the best male exhibited. Señor Eduardo Estanguet's Silver Cup was awarded to Captain A. L. Goodson's "Eurasian of Kilham," 94,834.

The Galloways brought out a satisfactory entry of 49, and made an excellent show. Mr Walter Biggar, Grange Farm, Castle-Douglas, obtained the Championship with "Flashlight of Castle Milk," 20,114 (Fig. 49), bred by Sir John William Buchanan-Jardine of Castle Milk, Bt., Castle Milk, Lockerbie. His sire was "Lord Anson of Castle Milk," 19,102, and dam "Fragrant of Waterside," 31,620. This two-year-old bull carried a beautiful head, and gave the impression of a fine breeding animal. He also secured for his owner the Dr Gillespie Memorial Challenge Trophy for the best Galloway on show. "Ideal of Castle Milk," 20,113, bred and exhibited by Sir John William Buchanan-Jardine, Bt., which beat the present Champion at Melrose, was awarded the Reserve ticket. The Silver Challenge Cup, presented by the Galloway Cattle Society for the best animal of the sex opposite to that of the winner of the Dr Gillespie Memorial Trophy, went to Buccleuch Estates Ltd., Holestane, Thornhill, their successful exhibit being the five-year-old cow "Musk Rose of Dumlanrig," 34,935, bred by the Duke of Buccleuch and Queensberry.

There was again a disappointing entry, numerically, of Belted Galloways, but the quality was well up to the standard. "Mark Advocate," 1085 B. (Fig. 50), won the premier award for the Nalc Co. Ltd., Gartmore, Perthshire. He carried plenty flesh and was shown in fine condition. This four-year-old was bred by Mr Robert Graham, Auchengassel, Twynholm, and was got by "Gartmore Herbert," 477 B., out of "Mark Soncie," 221 B. He also won the Knockbrex Challenge Cup for the best Galloway animal. Mr J. Douglas Brown, Corseyard, Kirkcudbright, took the Reserve position with a two-year-old heifer "Knockbrex Mavis," 3432 B., bred by himself, and she was also awarded the Ian Hamilton Silver Challenge Cup for the best Galloway of opposite sex to the Knockbrex Cup winner.

The entry of 50 Highland Cattle showed a welcome increase in numbers over the Melrose Show, and also over the last Show at Alloa. The President's Champion Medal was won for the second year in succession by Mrs Lees-Milne, Ardachy, Connel, Argyllshire, on this occasion with her three-year-old yellow bull "Prionnsa Buidhe II. of Kilchamaig," 3795 (Fig. 51), sire "Colkitto," 3422, dam "Blarag X.," 9767. The breeder of this outstanding and handsome bull was Miss Turner, Kilchamaig, Whitehouse, Argyll. The same animal was awarded the Highland Cattle Society's Perpetual Victory Challenge Cup for the best male on exhibition, and a light-brindled three-year-old heifer, "Laochag Chliniteach," 11,072, took the corresponding award in the female classes for her owner, Mr William Walker, of Foreland, Bruichladdich, Isle of Islay.

The Ayrshire Cattle entries, numbering 66 in all, were the same as for the Melrose Show, but there were many absentees, which made competition less keen. The quality on the whole was not exceptionally high, but it is noteworthy that the entries from Tuberculin-Tested and Attested Herds had increased appreciably. Mr John Clark, Dunrod Farm, Inverkip, repeated his Aberdeen (1935) Show successes by winning the President's Champion Medal, the Renfrewshire Perpetual Gold Challenge Cup, the Cowhill Challenge Cup, and the Special Prize of £10 given by the Ayrshire Cattle Herd-Book Society for the best female. The winner of all these honours was a home-bred four-year-old cow, "Dunrod Pearl 11th," 48,169 (Fig. 52). A fine upstanding white-and-brown cow, exhibiting excellent breeding character, she was the product of "Dunrod Sir Jacob," 27,973, and "Dunrod Pearl 4th," 21,285. The Reserve Champion for the second year in succession was "Meikle Kilmory Moss Rose 10th," 30,069, bred and owned by Mr James M'Alister, Meikle Kilmory, Rothesay. The Breed Society's Prize of £10 for the leading animal in the male classes was awarded to Mr David Wallace, Auchenbrain, Mauchline, for his three-year-old bull "Barboigh Revelenta," 35,342, bred by Mr Alexander Watson, Barboigh, Mauchline.

There was a large entry of 67 British Friesians, and most of these were forward, making a good show of unusually level quality. Both the Championship and Reserve went to imported bulls. Mr John Houston, Selvieland, Paisley, exhibited the Champion, "Royal (imported 1936) Hiltkees," 46,907 (Fig. 53), a massive bull bred by Mr B. D. Okma, Dijken, Woudsend, Friesland, Holland, his sire being "Kees 7th," 19,249 F.R.S., and dam, "Hiltje," 75,032 F.R.S. With him he also won the MacRobert Champion Silver Bell and the British Friesian Cattle Society's Prize of £5 for the best male animal. The Reserve Championship was secured by Mr Albert Weightman, Middle Herrington Farm, Sunderland, with "Herrington (imported 1936) Leo," 46,237, and the same exhibitor won the British Friesian Society's Silver Challenge Cup for the best group of three. The Breed Society's Prize of £5 for the best female was awarded to "Craigiemains Lady Evelyn," 176,764 R.M.P., R.M., a home-bred four-year-old cow owned by Mr James Kilpatrick, Craigie Mains, Kilmarnock.

HORSES.

Though falling slightly short of the Melrose Show numbers, the entry of Horses, 290 in all, was satisfactory, the decrease being accounted for by the falling off in the Hunter Section, which is always well supported at the Border Shows.

Clydesdale entries showed a considerable advance on Melrose, and made a fine display, especially in the brood mare and gelding sections. The winner of the President's Champion Medal for the best stallion or colt was found among the yearlings, Mr Alexander Clark, Strathore House, Thornton, being the successful exhibitor with "Strathore Imperial"

(Fig. 54). The breeder of this promising yearling bay colt of great weight and quality was Mr George M. Beck, Fremington, Brougham, Penrith, the sire being "Woodbank Majestic," 21,393, and dam "Lane Lady Luck," 61,884. He also secured for his owner the Fife and Kinross Perpetual Gold Challenge Cup and the Cawdor Challenge Cup for stallions and colts. The Reserve for the President's Medal was the two-year-old "Windlaw Aristocrat," 23,010, the winner of the Cawdor Cup for males at Melrose, the property of Mr James Clark, Windlaw, Carmunnock, and bred by Mr Thomas Robertson, Townhead, Annbank.

Though not quite so numerous as at Melrose, the Clydesdale Geldings were an outstanding section. Repeating his success at Melrose, Mr James Clark, Windlaw, Carmunnock, took leading place for the Championship and the Meiklem Gold Cup. "Walter" (Fig. 55), a powerful five-year-old brown, by "Dunure Fashion Hint," 18,705, out of "Blaithwaite Jess," 58,728, his breeder being Mr Harry Spark, High Blaithwaite, Wigton, was his winning entry. Messrs Greig, Housenrigg, Brayton, Aspatria, were awarded the Reserve ticket for "Maxwell," Dumfriesshire bred by Mr M'Kill Maxwell, Hayfield, Thornhill.

After keen competition Mr John M'Farlane, Bailielands, Auchterarder, succeeded in gaining the President's Champion Medal and the Cawdor Challenge Cup for best mare or filly. His winning exhibit was the brown yearling filly "May," (Fig. 56), got by "Benedictine," 21,836, out of the "Craigie Winalot" mare, "Sunhoney Winsome," 60,775. She made a fine appearance, being of great size and a sweet mover. The Reserve Champion of the females was the three-year-old filly "Seaham Ideal Lady," shown by Mr Douglas D. Murray, The Dene, Seaham Harbour.

Though not approaching in number the record of the Melrose Show, the entry of 61 Hunters was very satisfactory, and the all-round quality of the exhibits was praiseworthy. The President's Champion Medal went to a Border owner in Mr Arthur Paton, Whitehill, St Boswells, whose bay gelding, "Bluebeard" (Fig. 57), bred by himself, and sired by "Barbican" out of "Patience II.," was also awarded the Dumfries Centenary Silver Challenge Cup. This lightweight seven-year-old, nicely proportioned and with fine action, was being shown for the first time. Sir John William Buchanan-Jardine of Castle Milk, Bt., Castle Milk, Lockerbie, gained the Reserve award for his home-bred two-year-old bay gelding "Red Hot," 2119. The Hunters' Improvement, &c., Society's Champion Gold Medal for best filly was won by Captain J. Steel, Kirkwood, Lockerbie, with his home-bred yearling "Stampede," 8817.

There were again three classes for Riding Ponies, and though they did not fill as well as at the Melrose Show, they made a feature in which much interest was shown. Messrs David Patterson & Son, Church Street, Johnstone, secured first award in the first class with their gelding "Johnnie." A mare, "Rose Marie," shown by Mr Ian D. Henderson, 24 Park Road, Paisley, took the leading place in the second class, and the Misses E. and L. Glen-Coats, Fordbank, Milliken Park, Renfrewshire, were successful in the third with their mare "Wild Rose," 8701.

The entries in the Highland and Western Island Ponies Classes were well above the average of recent Shows, and their generally fine quality entitled the display in this section to be considered one of the best for many years. The ten-year-old dun mare, "Moldagh," 5939 (Fig. 58), bred by Mr James M. Cairns, Ardlarach House, Isle of Luing, got by "Dougald of Luing," 1218, out of "Moira," 5090, and shown as Extra Stock, took the principal awards for her owner, Mr T. G. Wilson, Carbeth Home Farm, Balfron Station. These were the President's Champion Medal, the Kinmonth Perpetual Gold Challenge Quaich, and the Dundee Citizens' Perpetual Silver Challenge Cup. A prize-winner at Alloa in 1929 and Champion at Dundee in 1933, this outstanding mare exhibited qualities which again brought her deserved success. Mr S. J. A. Cameron, Glenfinlas, Callander, gained the Reserve award and the Highland Pony Society's Special Prize of £8 for the best female animal (for which "Moldagh" as Extra Stock was ineligible) with a two-year-old filly, "Barra Ledi," 6958. Mr Thomas Wooley, Caledonian Hotel, Bonar Bridge, was awarded the corresponding Highland Pony Society's Prize for males for his five-year-old brown stallion "Loch Maddy," 1973.

For the Shetland Pony Classes a large and attractive entry was again forthcoming, and created the usual lively interest among patrons of the Show. It is interesting to record that the Championship and Reserve Championship of the Breed were won for the third consecutive year by the same exhibitors with the same animals. Mr J. E. Kerr, of Harviestoun, Dollar, led the field again with his wonderful five-year-old brood mare "Harviestoun Pixie" (Fig. 59), home-bred, by "Dunsmuir," 1155, out of "Harviestoun Pryde," 4544. She was again shown in perfect condition. The runner-up for the President's Medal was the six-year-old black stallion "Birk of Manar," 1301, shown as "Extra Stock," which, as indicated, has now obtained this award at three successive Shows for Mr Alexander Davidson, Mundurno, Bridge of Don. He also secured the Shetland Pony Stud-Book Society's Silver Medal for the best of the opposite sex to the winner of the President's Medal, and an award of £5 as Extra Stock. The Perpetual Silver Challenge Cup for the best group of three ponies was won for the second time by Mr J. E. Kerr, with his Champion mare "Harviestoun Pixie," the three-year-old filly "Harviestoun Pat," and the colt "Benito."

Hackneys in Harness brought out a rather small entry. Mr and Mrs Walter Briggs, Linden Hall, Borwick, Carnforth, Lancs., exhibited the Champion, "Barcroft Belle," 26,769 (Fig. 60), a ten-year-old bay mare bred by Mr J. E. Tweedale, Marland, Rochdale, while the Reserve was the mare "Riquette," 26,483, shown by Mr John M. Hamilton, Bogton, Muirend, Glasgow, which received an award of £5 as Extra Stock.

The Class for Draught Geldings was withdrawn owing to insufficient entries having been received.

There were included in the Horse Section, for exhibition only, two Suffolk stallions, "Holkham Pioneer," 6120, and "Wyverstone Monarch," 6058, both the property of Mr Dennis Walker, Old Hall Farm, Trowse, Norwich. They gave rise to considerable interest, and were awarded the Silver Medal.

In the Jumping Competitions Mr F. W. Foster, Fransy Farm, Etwall, Derby, with his gelding "Huntsman," won the Champion Prize of £10 for most points in the Open Classes. There was again a large entry in all the classes, and a number of the leading awards were shared by several contestants.

SHEEP, GOATS, PIGS, &C.

As was to be expected, the total of Sheep entries fell considerably short of the number at Melrose, but made a good average both in quantity and quality. The Blackface Classes were particularly strong numerically, and the chief fallings-off were in the Cheviot and Suffolk breeds. There were many outstanding animals among the Champions and Prize Winners. Goats again brought out only a moderate entry, but the usual exhibitors had some capital specimens forward. With about the same number of entries as last year, the show of pigs may be said to have been disappointing, but included some exceptionally well-bred and conditioned exhibits. Mr J. Ernest Cox, Methven Castle, Perthshire, was successful on this occasion in carrying off the Large White Championship. Illustrations of the President's Medal winners for Sheep, Goats, and Pigs will be found in Figs. 61 to 69.

Poultry recovered some of the ground lost at Melrose with an excellent entry of 551, and some of the leading birds were quite exceptionally good examples of their breeds. Dairy Produce, Honey, and Rural Industries all showed some reduction in numbers, but the quality was well maintained and competition keen.

Competitors for the Horse-Shoeing and Shoe-Making Prizes were forward in good numbers, and the judges' reports indicated that the general standard of workmanship showed no deterioration.

With the maximum age for participants in the Live Stock Judging events restored to 23 years there was an increased entry of 161 individuals. The usual keenness was displayed, and the results brought out that the Renfrewshire Young Farmers' Club (Team A.), with 294 points, had won the 'Glasgow Herald' Challenge Cup. Two competitors tied for first individual place, and they were each awarded a Gold Medal by Messrs George Outram & Co. Ltd., Glasgow. They were Mr Ian C. Gilmour, Cartsbridge, Clarkston, and Mr Alexander Park, Turningshaw Farm, Johnstone.

The Buttermaking Competitions were successfully carried through, with a good entry and the usual keen spirit of emulation, and they proved attractive to large numbers of visitors to the Show.

The Flower Show seems to grow more pleasing each year, and certainly the lay-out and display of flowers and plants at this Show was one which called for admiration from all who visited the section, and these were very numerous.

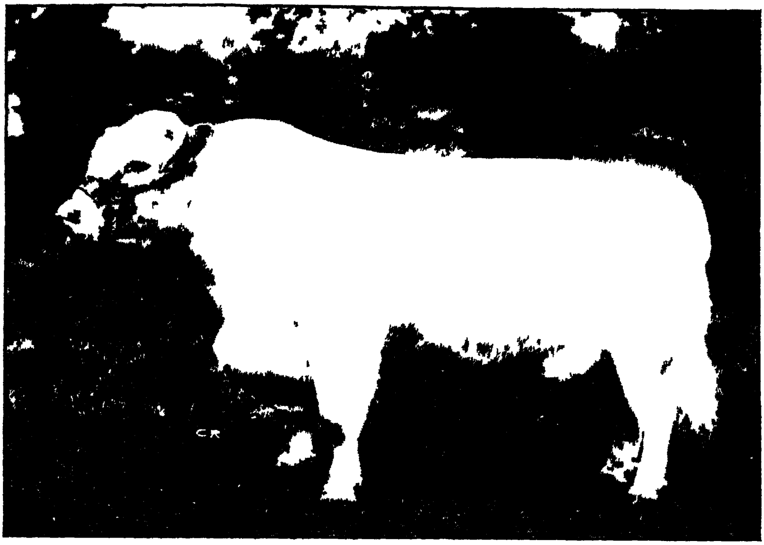

Fig. 47.—Shorthorn Bull, "Calrossie Control" 255,913.

Winner of President's Medal for best Shorthorn animal, Alloa Show, 1937. Bred by and the property of Captain John MacGillivray of Calrossie, Nigg Station, Ross-shire. Age five years and five months.

Fig. 48.—Aberdeen-Angus Cow, "Eulima 6th of Kilham" 102,652.

Winner of President's Medal for best Aberdeen-Angus animal, Alloa Show, 1937. Bred by and the property of Captain A. L. Goodson, Kilham, Mindrum, Northumberland. Age four years and six months.

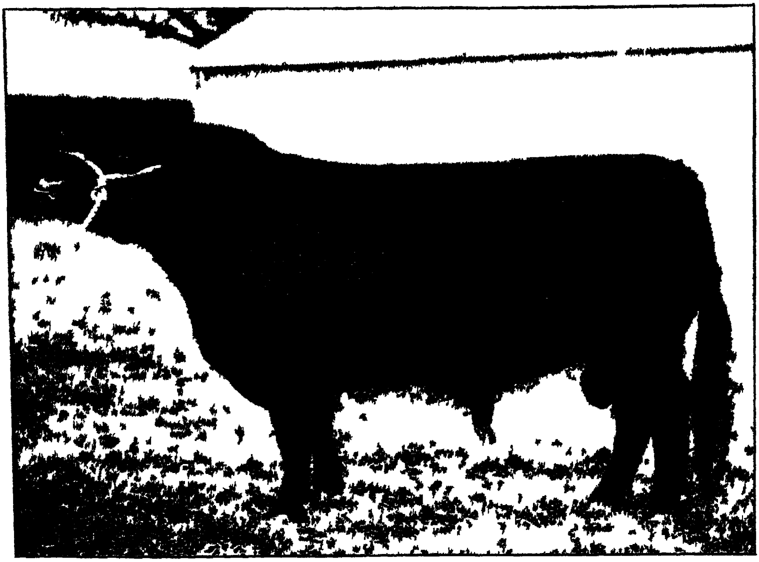

Fig 49 —Galloway Bull "Flashlight of Castle Milk" 20,114

Winner of President's Medal for best Galloway animal Alloa Show 1937 The property of Mr Walter Biggar Grange Farm Castle Douglas Bred by Sir John William Buchanan Jardine of Castle Milk Bart Castle Mill Lockerbie Age two years and two months

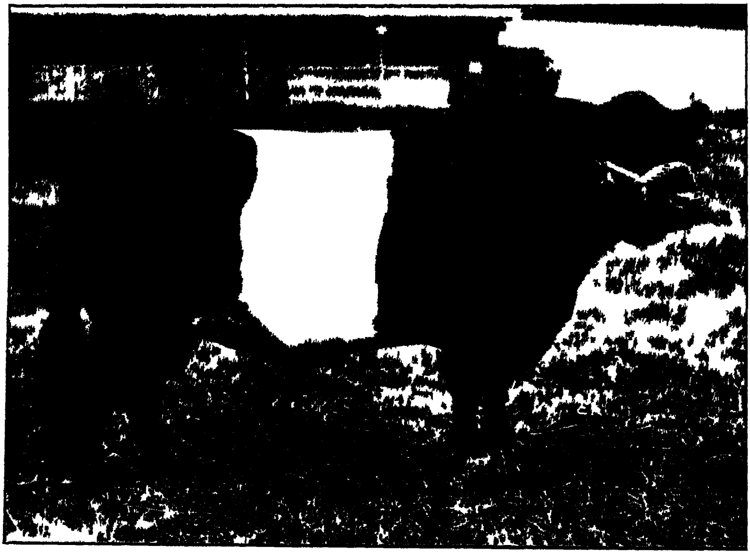

Fig 50 —Belted Galloway Bull, "Mark Advocate' 1085 B

Winner of President's Medal for best Belted Galloway animal Alloa Show, 1937 The property of Messrs Nalc Co , Ltd , Estates Office Gartmore Perthshire Bred by Mr Robert Graham Auchengassel, Twynholm Age four years and eight months

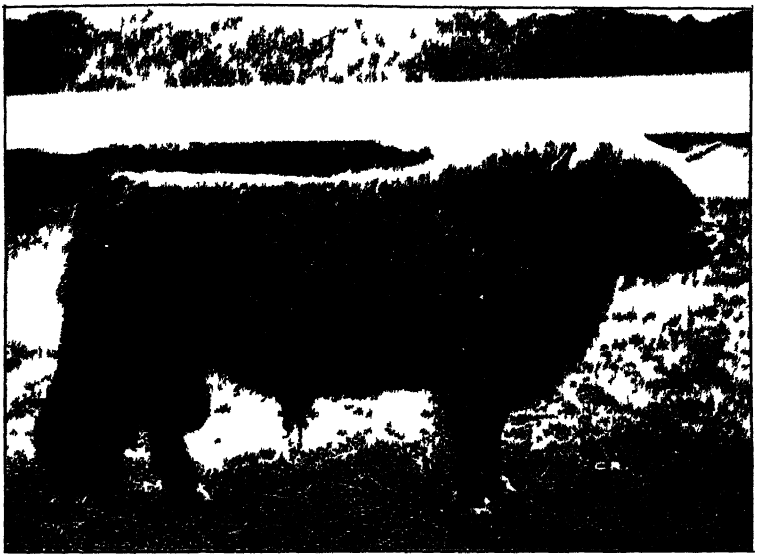

Fig 51 —HIGHLAND BULL, "PRIONNSA BUIDHE II OF KILCHAMAIG 3795

Winner of President's Medal for best Highland animal, Alloa Show, 1937 The property of Mrs Lees Milne Ardachy Connel Argyll Bred by Miss Turner Kilchamaig Whitehouse Argyll Age three years and four months

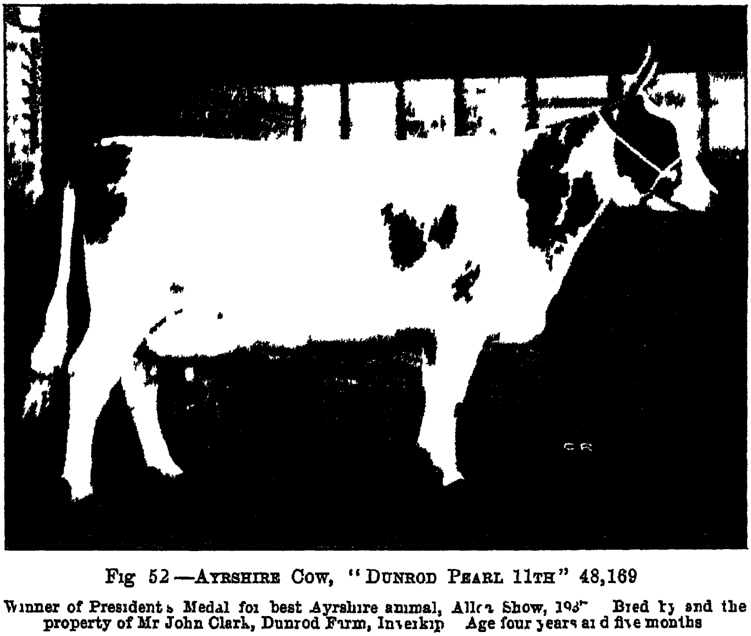

Fig 52—AYRSHIRE COW, "DUNROD PEARL 11TH" 48,169

Winner of President's Medal for best Ayrshire animal, Alloa Show, 1937 Bred by and the property of Mr John Clark, Dunrod Farm, Inverkip Age four years and five months

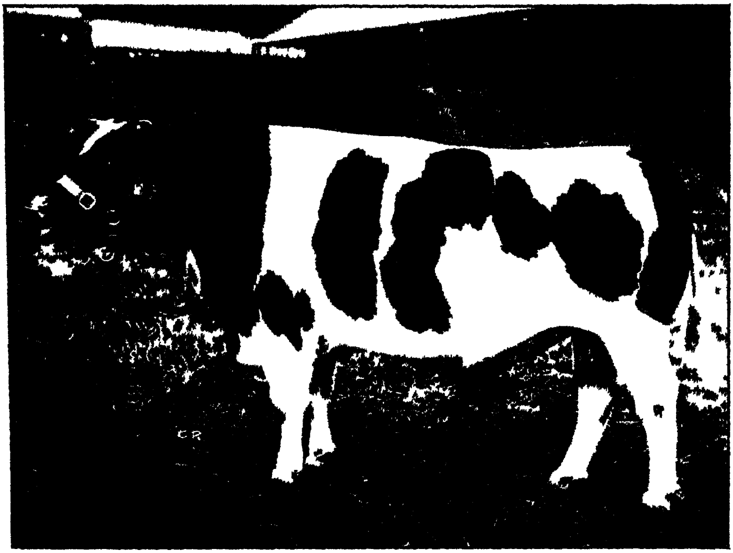

Fig 53 —BRITISH FRIESIAN BULL, "ROYAL (imported 1936) HILTKEES" 46,907.

Winner of President s Medal for best British Friesian animal, Alloa Show, 1937 The property of Mr John Houston, Selvieland, Paisley Bred by Mr B D Okma, Dijken, Woudsend, Friesland, Holland Age three years and seven months

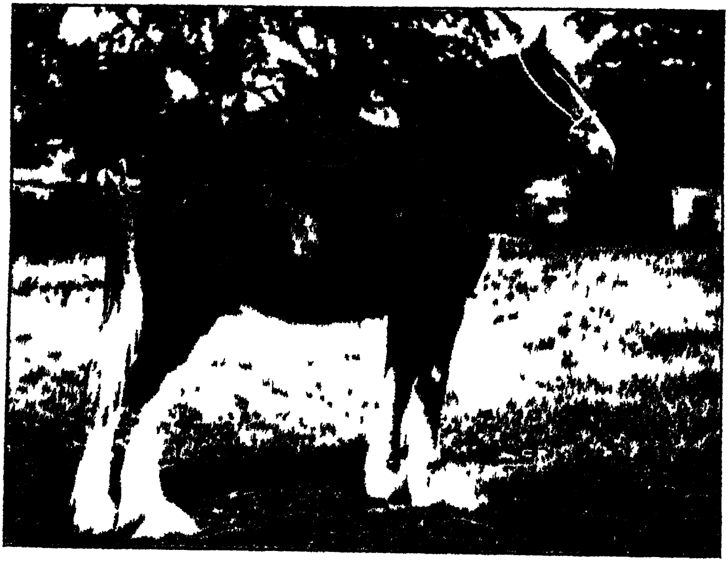

Fig. 54.—CLYDESDALE ENTIRE COLT, "STRATHORE IMPERIAL"

Winner of President s Medal for best Clydesdale Stallion or Colt, Alloa Show, 1937. The property of Mr Alexander Clark, Strathore House, Thornton Bred by Mr George M Beck, Fremington, Brougham, Penrith Age one year and two months.

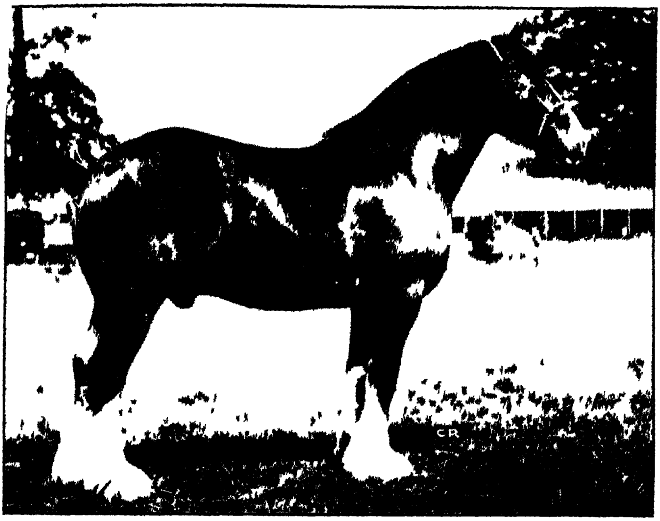

Fig. 55.—Clydesdale Gelding, "Walter."

Winner of President's Medal for best Clydesdale Gelding, Alloa Show, 1937. The property of Mr James Clark, Windlaw, Carmunnock Bred by Mr Harry Spark, High Blaithwaite, Wigton Age five years and one month

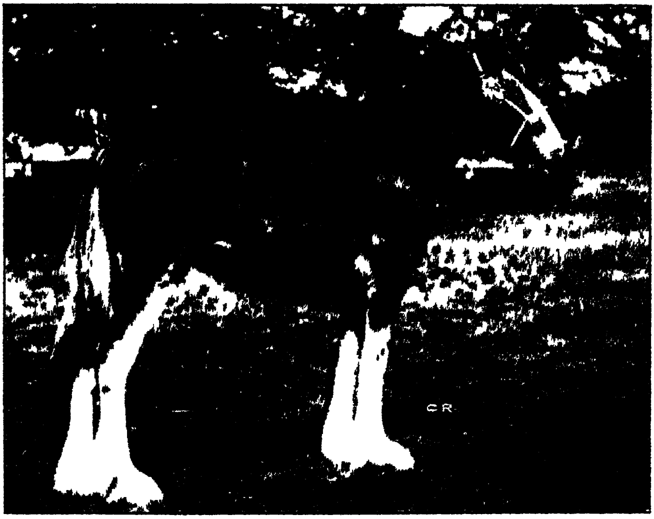

Fig. 56.—Clydesdale Filly, "May."

Winner of President's Medal for best Clydesdale Mare or Filly, Alloa Show, 1937. The property of Mr John M'Farlane, Baillielands, Auchterarder Bred by Mr George Robertson, Sunhoney, Echt. Age one year and two months

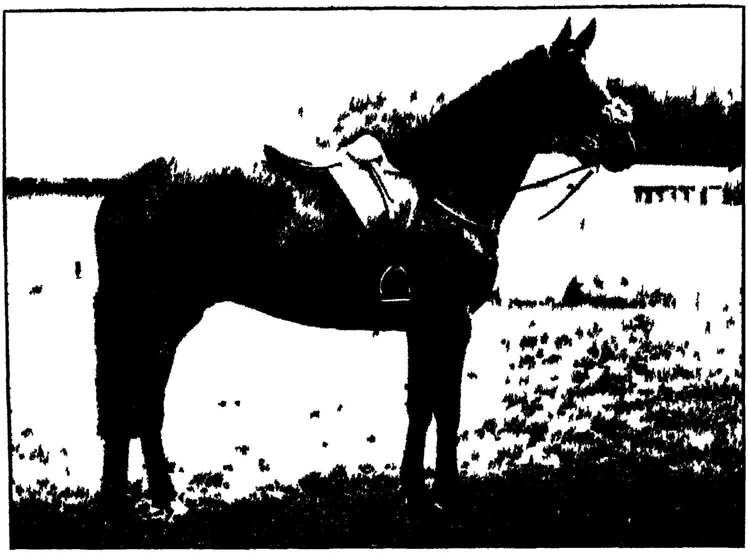

Fig 57 —HUNTER GELDING, "BLUEBEARD"

Winner of President's Medal for best Hunter, Alloa Show, 1937 Bred by and the property of Mr Arthur Paton Whitehill, St Boswells Age seven years and two months

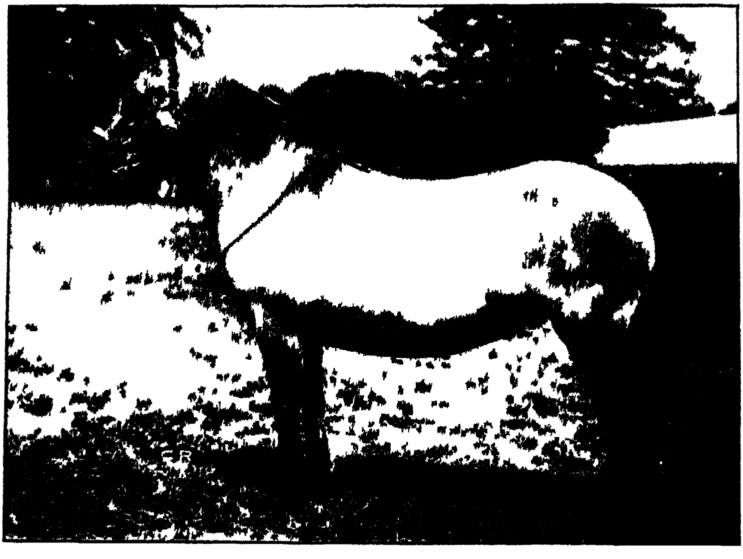

Fig 58 —HIGHLAND PONY MARE, "MOLDAGH" 5939.

Winner of President's Medal for best Highland or Western Island Pony, Alloa Show, 1937 The property of Mr T G Wilson Carbeth Home Farm, Balfron Station Bred by Mr James M Cairns, Ardlarach House, Isle of Luing Age ten years

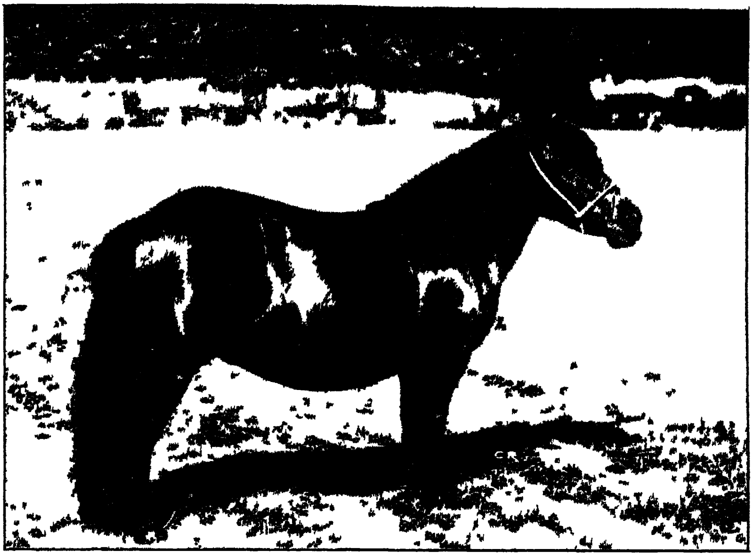

Fig 59 —SHETLAND PONY MARE, "HARVIESTOUN PIXIE"

Winner of President's Medal for best Shetland Pony Alloa Show, 1937 Bred by and the property of Mr J E Kerr of Harviestoun, Dollar Age five years

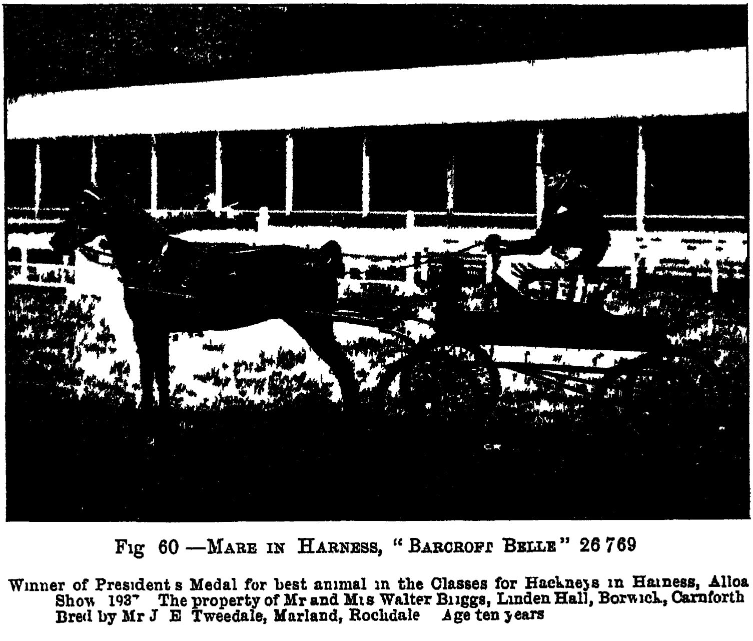

Fig 60 —MARE IN HARNESS, "BARCROFT BELLE" 26 769

Winner of President's Medal for best animal in the Classes for Hackneys in Harness, Alloa Show 1937 The property of Mr and Mrs Walter Briggs, Linden Hall, Borwick, Carnforth Bred by Mr J E Tweedale, Marland, Rochdale Age ten years

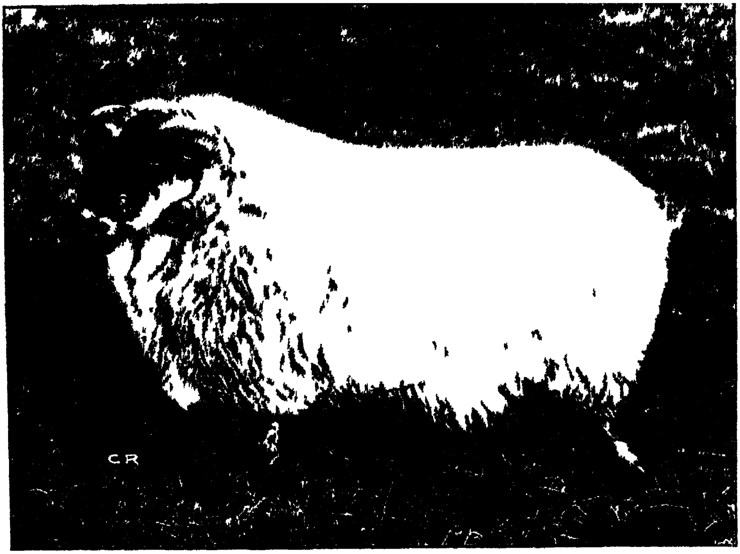

Fig. 61 —BLACKFACE TUP

Winner of President's Medal for best Blackface Sheep, Alloa Show, 1937 Bred by and the property of Mr Matthew G Hamilton, Woolfords, Cobbinshaw Age four shear

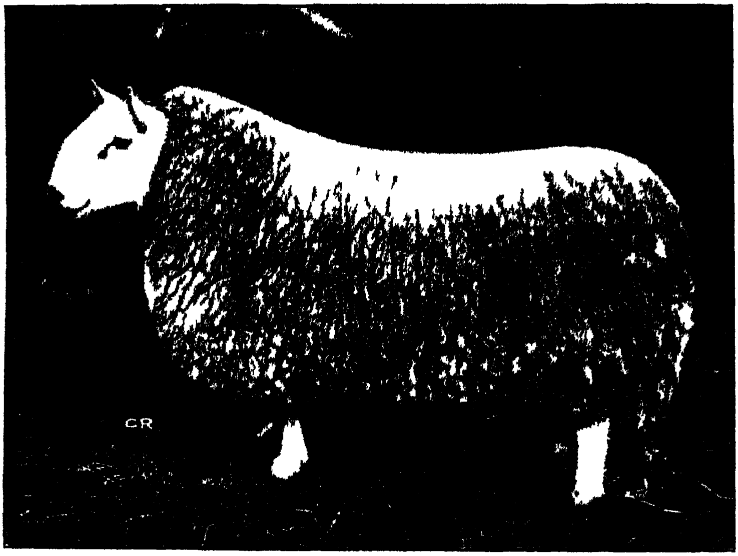

Fig. 62.—CHEVIOT TUP

Winner of President's Medal for best Cheviot Sheep, Alloa Show, 1937. The property of Mr Arthur Elliot, Hindhope, Jedburgh. Bred by Mr Walter S Douglas, Upper Hindhope, Jedburgh. Age three shear.

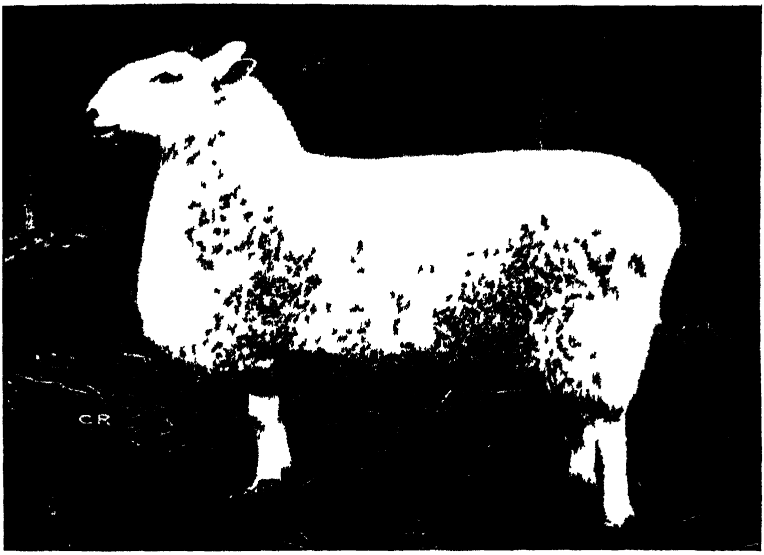

Fig 63 —Border Leicester Tup, "Sandyknowe Coronation" 11,308.

Winner of President's Medal for best Border Leicester Sheep Alloa Show, 1937 The property of Colonel E W S Balfour, D S O, O B E, M C, of Balbirnie, Markinch Bred by Messrs T & M Templeton, Sandyknowe, Kelso Age two shear

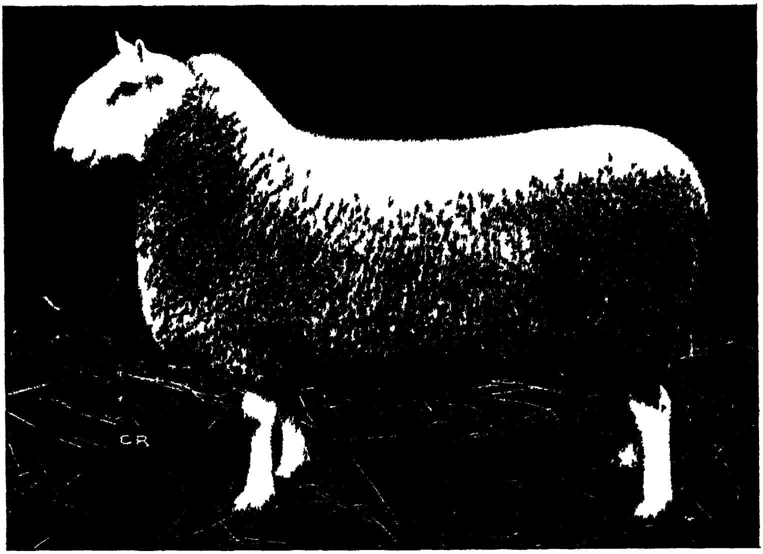

Fig 64 —Half Bred Shearling Tup

Winner of President's Medal for best Half Bred Sheep, Alloa Show, 1937 Bred by and the property of Mr John Elliot, Blackhaugh, Clovenfords

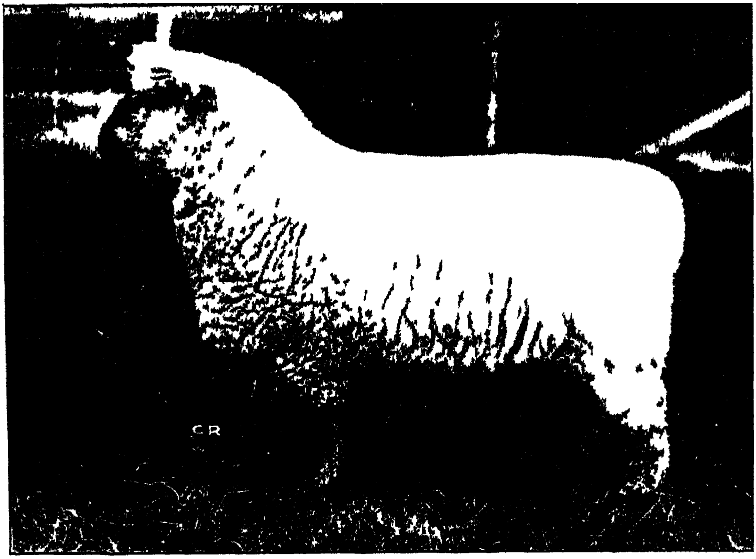

Fig 65 —Oxford Down Shearling Tup

Winner of President's Medal for best Oxford Down Sheep, Alloa Show, 1937 The property of Mr John Kinnaird, Papple Haddington Bred by Mr R G Adams Fernham Manor Faringdon Berks

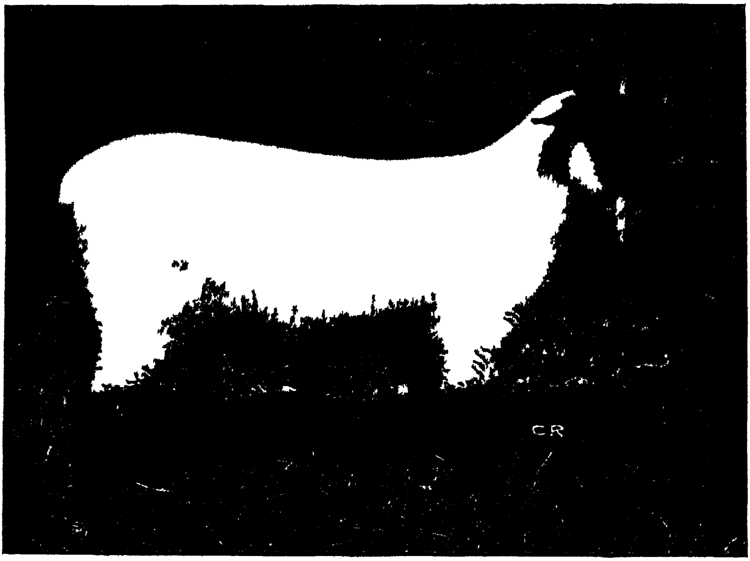

Fig 66 —Suffolk Ewe Lamb.

Winner of President's Medal for best Suffolk Sheep, Alloa Show 1937 Bred by and the property of Messrs William G Whitton, Ltd , Ingliston Farm, Eassie, Angus

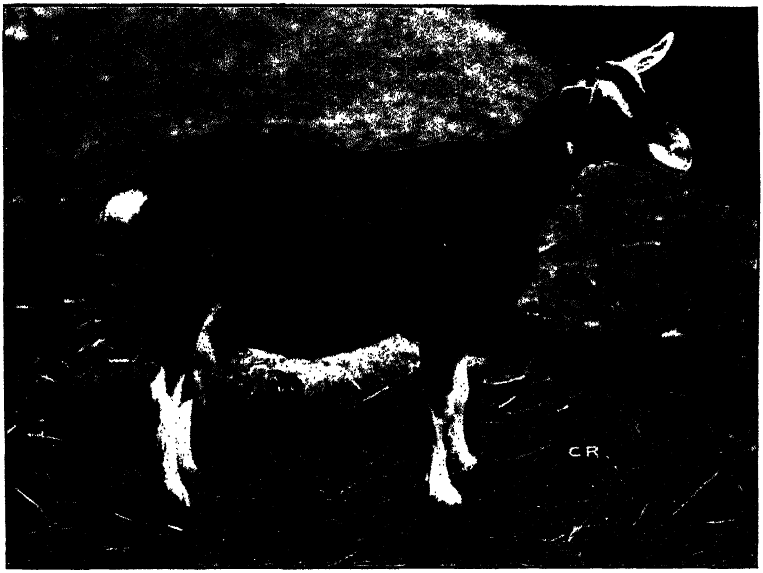

Fig. 67.—British Alpine Goat, "Dupplin Harpist" BA 1101.

Winner of President's Medal for best animal in the Goat Classes, Alloa Show, 1937. Bred by and the property of The Dowager Lady Forteviot, Galloway House, Garlieston, Wigtownshire. Age three years and three months.

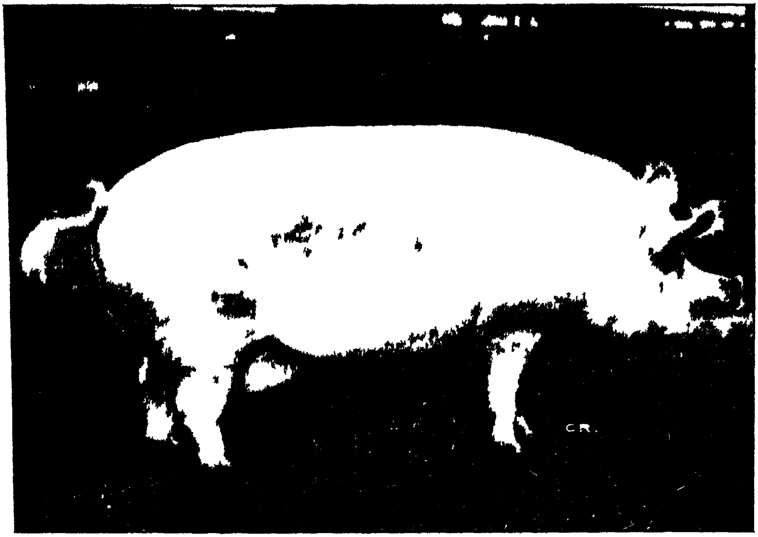

Fig 68 —Large White Boar, "Berkswell Jay 15th 98,153

Winner of Presidents Medal for best Large White Pig Alloa Show 1937 The property of Mr J Ernest Cox Methven Castle Methven Bred by Colonel C J H Wheatley Berkswell Hall Berkswell Age two years and five months

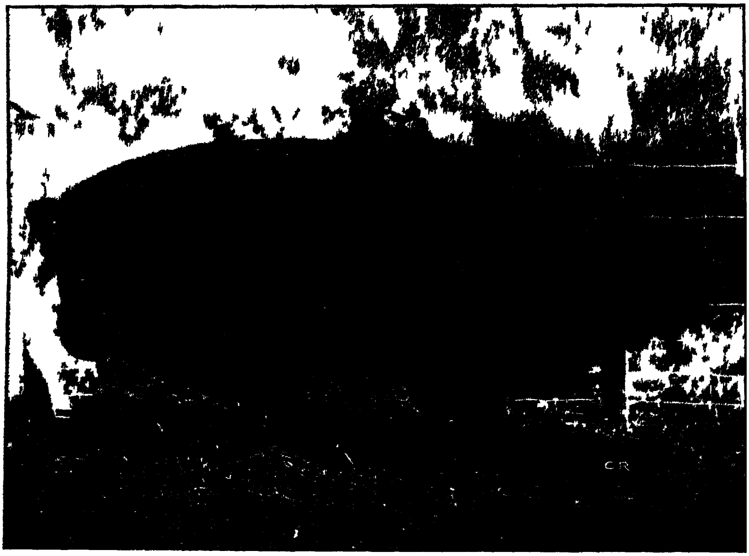

Fig 69 —Large Black Boar, "Pakenham Sundial 2nd ' K 243

Winner of Presidents Medal for best Large Black Pig Alloa Show, 1937 The property of Mr E A Waith Upwood Hill House Ramsey, Huntingdon Bred by Mr D W P Gough, Pakenham Manor Bury St Edmunds Age four years and eleven months

PREMIUMS AWARDED BY THE SOCIETY IN 1937.

ALLOA SHOW.

22nd, 23rd, 24th, and 25th June 1937.

ABBREVIATIONS.—V., *Very Highly Commended.* H., *Highly Commended.* C., *Commended.*

CATTLE

SHORTHORN.

PRESIDENT'S CHAMPION MEDAL
for best Shorthorn Animal.

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire, " Calrossie Control " (255,913).

Reserve—No. 10 Honeyman, R. Wemyss, Derculich and Ballechin, Strathtay, Perthshire, " Calrossie Silver Wedding " (275,443).

Edinburgh Corporation Perpetual Gold Challenge Cup *for best Shorthorn Animal, " Extra Stock " eligible to compete.* This Cup was presented by the City of Edinburgh to commemorate the Society's Hundredth Show.

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire, " Calrossie Control " (255,913).

Reserve—No. 10 Honeyman, R. Wemyss, Derculich and Ballechin, Strathtay, Perthshire, " Calrossie Silver Wedding " (275,443).

The Duthie Perpetual Challenge Cup, value £150, *for best Animal in the Shorthorn Classes, " Extra Stock " eligible to compete.* This Cup was gifted by the late Mr William Duthie, Collynie.

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire, " Calrossie Control " (255,913).

Silver Cup, value £50, *for the best Group of three animals in the Shorthorn Classes, consisting of one Bull and two Females, " Extra Stock " eligible to compete.* Given by Mr William M'Nair Snadden of The Coldoch, Blair Drummond.

Nos. 18, 38, and 51 Snadden, W. M'Nair, of The Coldoch, Blair Drummond.

Tweeddale Gold Medal, value about £25, *for best Shorthorn Bull, " Extra Stock " eligible to compete.*

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire, " Calrossie Control " (255,913).

The Emilio R. Casares, jun., " Junior Memorial Champion Cup," value 50 guineas, *for best Shorthorn Bull in Class 4, calved on or after 1st April of the year preceding the year of the Show, that has passed the tuberculin test.* Given by Messrs J. Baird & Co. (Falkirk), Ltd., Bantaskin, Falkirk.

No. 20 Baird, J., & Co. (Falkirk), Ltd., Bantaskin, Falkirk, " Royal Pride."

Reserve—No. 27 Snadden, W. M'Nair, of The Coldoch, Blair Drummond, " Coldoch Silver Crest."

Best Shorthorn Bull in the Show, entered or eligible for entry in Coates's Herd-Book—£20, given by the Shorthorn Society.

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire, " Calrossie Control " (255,913).

Silver Medal *to the Breeder of the winner of above Prize*—given by the Shorthorn Society.

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire.

Breeder of best Bull of any age in Classes 1 to 4 (" Extra Stock " not eligible to compete)—The Silver Medal.

No. 5 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire.

CLASS 1. BULL, born before 1st December 1934.—PREMIUMS, £15, £10, £5, and £3.

1st	No. 5	MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire, "Calrossie Control" (255,913).
2nd	No. 6	Piper, James, of The Grange, Burntisland, "Bapton Banner Bearer" (268,265).
3rd	No. 3	Hill, R. Wylie, of Balthayock, Perth, "Calrossie Grand National" (268,893).
4th	No. 7	Reid, R. M., Tillyrie, Milnathort, "Pittodrie Double Event" (272,510).
V	No. 4	Jones, P. Forbes, Dunmore Park, Dunmore, Stirlingshire, "Cruggleton Reservist" (269,670).
H	No. 2	Crawford and Balcarres, The Earl of, K.T., Balcarres House, Colinsburgh, Fife, "Crieffvechter Finance" (262,934).

CLASS 2. BULL, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £15, £10, £5, and £3.

1st	No. 10	Honeyman, R. Wemyss, Derculich and Ballechin, Strathtay, Perthshire, "Calrossie Silver Wedding" (275,443).
2nd	No. 13	Stewart, Duncan M., Millhills, Crieff, "Collynie Era" (275,914).
3rd	No. 9	Baird, J., & Co. (Falkirk), Ltd., Bantaskin, Falkirk, "Coldoch Ronald" (275,886).
4th	No. 8	Anderson, G. J. C., Kair, Fordoun, Kincardineshire, "Glastullich Champion" (270,547).

CLASS 3. BULL, born on or after 1st December 1935, and before 1st April 1936.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 18	Snadden, W. M'Nair, of The Coldoch, Blair Drummond, "Balthayock Grand National."
2nd	No. 15	Baird, J., & Co. (Falkirk), Ltd., Bantaskin, Falkirk, "Calrossie Embassy."
3rd	No. 19	Stewart, Duncan M., Millhills, Crieff, "Millhills Starlight."
4th	No. 17	Jones, P. Forbes, Dunmore Park, Dunmore, Stirlingshire, "Dundermot Roving Sovereign."
V	No. 16	Crawford and Balcarres, The Earl of, K.T., Balcarres House, Colinsburgh, Fife, "Ballechin Prince Paul."
H	No. 14	Baird, J., & Co. (Falkirk), Ltd., Bantaskin, Falkirk, "Coldoch Grand Parade."

CLASS 4. BULL, born on or after 1st April 1936.—PREMIUMS, £10, £6, £4, and £2.

1st	No. 20	Baird, J., & Co. (Falkirk), Ltd., Bantaskin, Falkirk, "Royal Pride."
2nd	No. 27	Snadden, W. M'Nair, of The Coldoch, Blair Drummond, "Coldoch Silver Crest."
3rd	No. 24	Jones, P. Forbes, Dunmore Park, Dunmore, Stirlingshire, "Larbert Tor."
4th	No. 21	Baird, J., & Co. (Falkirk), Ltd., Bantaskin, Falkirk, "Calrossie Rover."
V	No. 26	Robertson, Major William B., Colton, Dunfermline, "Cruggleton Conan."
H	No. 25	Piper, James, of The Grange, Burntisland, "Letham Laird."

Best Shorthorn Female in the Show, entered or eligible for entry in Coates's Herd-Book—£20, given by the Shorthorn Society.

No. 32 Smith, R. Laidlaw, Pittodrie, Pitcaple, Aberdeenshire, "Calrossie Blyth Pam" (130,739).

Silver Medal *to the Breeder of the winner of above Prize*—given by the Shorthorn Society.

No. 32 MacGillivray, Captain John, of Calrossie, Nigg Station, Ross-shire.

CLASS 5. COW, in Milk, born before 1st December 1933.—PREMIUMS, £12, £8, £4, and £2.

1st No. 31 Snadden, W. M'Nair, of The Coldoch, Blair Drummond, "Coldoch Nonpareil 2nd" (153,055).
2nd No. 29 Robertson, Major William B., Colton, Dunfermline, "Muriel Mysie" (131,176).
3rd No. 30 Snadden, W. M'Nair, of The Coldoch, Blair Drummond, "Coldoch Rosewood" (143,325).
4th No. 28 Crawford and Balcarres, The Earl of, K.T., Balcarres House, Colinsburgh, Fife, "Balcarres Jeanne" (156,704).

EXTRA STOCK.

The following received an award of £10 :—

No. 32 Smith, R. Laidlaw, Pittodrie, Pitcaple, Aberdeenshire, "Calrossie Blyth Pam" (130,739).

CLASS 6. COW, in Milk, born on or after 1st December 1933, and before 1st December 1934.—PREMIUMS, £10, £5, £3, and £2.

1st No. 35 Smith, R. Laidlaw, Pittodrie, Pitcaple, Aberdeenshire, "Pittodrie Patricia" (172,492).
2nd No. 33 Crawford and Balcarres, The Earl of, K.T., Balcarres House, Colinsburgh, Fife, "Balcarres Edna" (166,410).

CLASS 7. COW or HEIFER, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 37 Piper, James, of The Grange, Burntisland, Heifer, "Letham Rothes Queen 2nd" (181,297).
2nd No. 38 Snadden, W. M'Nair, of The Coldoch, Blair Drummond, Heifer, "Coldoch Beauty 2nd" (182,479).
3rd No. 39 Stewart, Duncan M., Millhills, Crieff, Heifer, "Cherrywood 9th" (182,633).
4th No. 36 Hill, R. Wylie, of Balthayock, Perth, Heifer, "Balthayock Victoria 28th" (178,332).

CLASS 8. HEIFER, born on or after 1st December 1935, and before 1st April 1936.—PREMIUMS, £10, £5, £3, and £2.

1st No. 47 Stewart, Duncan M., Millhills, Crieff, " Balmerino Iris."
2nd No. 40 Black, H. S., Banchory, Coupar-Angus, " Broadhooks Nanette 7th."
3rd No. 45 Robertson, Major William B., Colton, Dunfermline, " Scotston Lavender Lass."
4th No. 44 Jones, P. Forbes, Dunmore Park, Dunmore, Stirlingshire, " Larbert Nonpareil 25th."
V No. 48 Watherston, R. H., Crichton Mains, Ford, Midlothian, " Crichton Augusta 3rd."
H No. 46 Robertson, Major William B., Colton, Dunfermline, " Scotston Louise."
C No. 41 Cameron, R. C., Greenlawdean, Greenlaw, " Greenlaw Charity 2nd."
C No. 42 Crawford and Balcarres, The Earl of, K.T., Balcarres House, Colinsburgh, Fife, " Balcarres Blonde."
C No. 43 Hill, R. Wylie, of Balthayock, Perth, " Balthayock Butterfly 12th "

CLASS 9. HEIFER, born on or after 1st April 1936.—PREMIUMS, £10, £5, £3, and £2.

1st No. 51 Snadden, W. M'Nair, of The Coldoch, Blair Drummond, " Lavender Lady."
2nd No. 52 Stewart, Duncan M., Millhills, Crieff, " Millhills Royal Princess 4th."
3rd No. 50 Robertson, Major William B., Colton, Dunfermline, " Scotston Jealous Jean."

ABERDEEN-ANGUS.

PRESIDENT'S CHAMPION MEDAL for best Aberdeen-Angus Animal.

No. 97 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, " Eulima 6th of Kilham " (102,652).

Reserve—No. 53 Atkinson, Captain F. B., Gallowhill, Morpeth, Northumberland, " Elver of Gallowhill " (87,177).

The " Angus " Perpetual Silver Challenge Cup, value 50 guineas, *for the best Aberdeen-Angus Animal, " Extra Stock " eligible to compete.* This Cup was presented by the Angus Agricultural Association to commemorate the holding of the Society's Annual Show at Dundee in 1933.

No. 97 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, " Eulima 6th of Kilham " (102,652).

Silver Cup, value £50, *for best Group of Aberdeen-Angus Cattle, consisting of one Bull and two Females, "Extra Stock" not eligible to compete.* Given by Mr J. E. Kerr of Harviestoun, Dollar.

Nos. 86, 97, 112 Goodson, Captain A. L., Kilham, Mindrum, Northumberland.

Silver Cup, value 50 guineas, *for best Aberdeen-Angus Bull born on or after 1st December* 1934. Given by Senor Eduardo Estanguet, Argentina.

No. 86 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, "Eurasian of Kilham" (94,834).

Breeder of best Bull of any age in Classes 10 *to* 13 (*"Extra Stock" not eligible to compete*)—The Silver Medal.

No. 53 Atkinson, Captain F. B., Gallowhill, Morpeth, Northumberland.

Ballindalloch Challenge Cup, value £50, *for the best Bull of any age in Classes* 10 *to* 13. Presented by the late Sir George Macpherson Grant, Bt.

No. 53 Atkinson, Captain F. B., Gallowhill, Morpeth, Northumberland, "Elver of Gallowhill" (87,177).

Exhibitor of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.

No. 53 Atkinson, Captain F. B., Gallowhill, Morpeth, Northumberland.

Breeder (if not also the Exhibitor) of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.

Not awarded.

CLASS 10. BULL, born before 1st December 1934.—PREMIUMS, £15, £10, £5, and £3.

1st	No. 53	Atkinson, Captain F. B., Gallowhill, Morpeth, Northumberland, "Elver of Gallowhill" (87,177).
2nd	No. 54	Donald, William, Gaidrew, Drymen, Stirlingshire, "Disponer" (83,459).
3rd	No. 55	Elliot, F. & C., Nisbet Hill, Duns, "Eljoe of Bleaton" (87,140).
4th	No. 57	Reid, Andrew T., Auchterarder House, Auchterarder, "Enterprise of Gloagburn" (87,255).
V	No. 56	Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Bundemar of Doonholm" (86,655).

CLASS 11. BULL, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £15, £10, £5, and £3.

1st	No. 64	Reid, R. M., Tillyric, Milnathort, "Edmonton of Bleaton" (90,678).
2nd	No. 60	Forteviot, Lord, of Dupplin, Dupplin Castle, Perthshire, "Ericsson of Bleaton" (91,034).
3rd	No. 65	Robertson, Peter D., Castlecraig, Nigg, Ross-shire, "Eminent of Logie" (90,894).
4th	No. 62	Hamilton, William, Tullochgribban, Grantown-on-Spey, "Black Lad of Tullochgribban" (90,087).
V	No. 59	Elgin, The Earl of, K.T., C.M.G., Broomhall, Dunfermline, "Ervum of Harviestoun" (91,087).
H	No. 66	Templeton, T. & M., Sandyknowe, Kelso, "Esplendor" (91,110).
C	No. 61	Grant, John C., Garvault, Advie, Strathspey, "Walford" (93,270).
C	No. 63	Macbeth, W. Gilchrist, of Dunira, Comrie, "Eurova of Dunira" (91,181).

CLASS 12. BULL, born on or after 1st December 1935, and before 1st March 1936.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 67	Allendale, Viscount, Bywell, Stocksfield-on-Tyne, "Major of Bywell" (95,879).
2nd	No. 70	Cran, James B., Morlich, Glenkindie, Aberdeenshire, "Etheric of Bleaton" (94,804).
3rd	No. 75	Marshall & Mitchell, Bleaton, Blairgowrie, "Elix of Bleaton" (94,504).
4th	No. 68	Atkinson, Captain F. B, Gallowhill, Morpeth, Northumberland, "Prosperity of Gallowhill" (96,561).
V	No. 77	Ross-Taylor, J. P., Mungoswalls, Duns, "Mungos Haakon" (96,054).
H	No. 73	Kerr, J. E., of Harviestoun, Dollar, "Jazi Eric" (95,545).
C	No. 69	Ballingall, George, Nether Strathkinness, St Andrews, "Gaffer Dosman" (95,059).
C	No. 71	Honeyman, R. Wemyss, Derculich, Strathtay, Perthshire, "Eradicator of Derculich" (94,647).

CLASS 13. BULL, born on or after 1st March 1936.—PREMIUMS, £10, £6, £4, and £2.

1st	No. 86	Goodson, Captain A. L., Kilham, Mindrum, Northumberland, "Eurasian of Kilham" (94,834).
2nd	No. 87	Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Elegant of Stonefold" (94,485).
3rd	No. 85	Elliot, F. & C., Nisbet Hill, Duns, "Erepis" (94,674).
4th	No. 84	Elgin, The Earl of, K.T., C.M.G., Broomhall, Dunfermline, "Epigram of Broomhall" (94,629).
V	No. 79	Beddie, James, Banks, Strichen, "Eurus of Banks" (94,846).
H	No. 91	Templeton, T. & M., Sandyknowe, Kelso, "Everervis" (94,913).
C	No. 83	Donald, William, Gaidrew, Drymen, Stirlingshire, "Pridello of Gaidrew" (96,414).
C	No. 82	Donald, William, Gaidrew, Drymen, Stirlingshire, "Ethiope of Lethen" (94,808).

Silver Cup, value £50, *for the best Female Animal of the Aberdeen-Angus breed. "Extra Stock" eligible to compete.* Presented by Mr Falconer L. Wallace of Candacraig, Strathdon.

No. 97 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, "Eulima 6th of Kilham" (102,652).

Champion Gold Medal, value £10, *for best Animal in the Breeding Classes, breeding animals shown as "Extra Stock" eligible to compete.* Given by the Aberdeen-Angus Cattle Society.

No. 97 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, "Eulima 6th of Kilham" (102,652).

CLASS 14. COW, in Milk, born before 1st December 1933.—PREMIUMS, £12, £8, £4, and £2.

1st No. 97 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, "Eulima 6th of Kilham" (102,652).
2nd No. 100 Kerr, J. E., of Harviestoun, Dollar, "Erective of Harviestoun" (97,061).
3rd No. 93 Elgin, The Earl of, K.T., C.M.G., Broomhall, Dunfermline, "Erebeur of Broomhall" (99,490).
4th No. 99 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Euphorbia of Doonholm" (100,122).
V No. 94 Findlay, Sir Edmund, Bt., Home Farm, Aberlour, Banffshire, "Euxida 10th" (102,512).
H No. 98 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Muscatel of Doonholm" (97,050).
C No. 101 Vint, Wyndham T., Terry's Farm, Ormside, Appleby, "Benze of Nisbethill" (96,363).
C No. 95 Forteviot, Lord, of Dupplin, Dupplin Castle, Perthshire, "Embola of Candacraig" (98,448).

CLASS 15. COW, in Milk, born on or after 1st December 1933, and before 1st December 1934.—PREMIUMS, £12, £8, £4, and £2.

1st No. 102 Beddie, James, Banks, Strichen, "Gammer Ebenil" (104,726).
2nd No. 103 Forteviot, Lord, of Dupplin, Dupplin Castle, Perthshire, "Elysa of Dupplin" (105,572).
3rd No. 106 Reid, Andrew T., Auchterarder House, Auchterarder, "Ravity of Auchterarder" (106,923).
4th No. 104 Kerr, J. E., of Harviestoun, Dollar, "Ethera of Harviestoun" (106,102).
V No. 107 Russell, G. H., of The Burn, Glenesk, Brechin, "Bubona of The Burn" (107,077).
H No. 108 Stewart, Captain J. C., Murdostoun Castle, Newmains, "Barada of Murdostoun" (107,231).

CLASS 16. COW or HEIFER, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 111 Forteviot, Lord, of Dupplin, Dupplin Castle, Perthshire, Cow, "Betty Black of Ballintomb" (107,702).
2nd No. 112 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, Heifer, "Brazen Maid of Kilham" (108,707).

3rd	No. 115	Kerr, J. E., of Harviestoun, Dollar, Heifer, "Joyance Erica" (109,188).
4th	No. 119	Reid, Andrew T., Auchterarder House, Auchterarder, Heifer, "Proud Granada of Auchterarder" (110,056).
V	No. 120	Russell, G. H., of The Burn, Glenesk, Brechin, Heifer, "Proud Balyra of The Burn" (110,209).
H	No. 113	Ivory, Basil, Binny House, Uphall, West Lothian, Cow, "Braganza" (108,840).
C	No. 110	Beddie, James, Banks, Strichen, Heifer, "Mystery Rose" (107,844).
C	No. 114	Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, Heifer, "Prudence of Doonholm" (109,174).

CLASS 17. HEIFER, born on or after 1st December 1935, and before 1st March 1936.—PREMIUMS, £10, £5, £3, and £2.

1st	No. 133	Laidlaw, Right Hon. T. K., Somerton, Castleknock, Co. Dublin, "Pride of Melba 3rd" (110,952).
2nd	No. 123	Elgin, The Earl of, K.T., C.M.G., Broomhall, Dunfermline, "Black Sadie of Broomhall" (111,754).
3rd	No. 135	Macbeth, W. Gilchrist, of Dunira, Comrie, "Florette of Borgie" (113,125).
4th	No. 131	Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Margaux of Doonholm" (112,501).
V	No. 128	Honeyman, R. Wemyss, Derculich, Strathtay, Perthshire, "Gentian of Derculich" (112,330).
H	No. 137	Reid, Andrew T., Auchterarder House, Auchterarder, "Bramble of Auchterarder" (113,444).
C	No. 139	Ross-Taylor, J. P., Mungoswalls, Duns, "Mungos Elsna" (113,566).
C	No. 138	Reid, R. M., Tillyrie, Milnathort, "Eleanor 3rd of Tillyrie" (113,460).
C	No. 132	Kerr, J. E., of Harviestoun, Dollar, "Jay Erica" (112,516).
C	No. 136	Reid, Andrew T., Auchterarder House, Auchterarder, "Pride of Evenfold" (113,449).
C	No. 130	Ivory, Basil, Binny House, Uphall, West Lothian, "Pretty Para of Ballintomb" (110,951).

CLASS 18. HEIFER, born on or after 1st March 1936.—PREMIUMS, £10, £5, £3, and £2.

1st	No. 148	Allendale, Viscount, Bywell, Stocksfield-on-Tyne, "Mavis of Bywell" (110,979).
2nd	No. 151	Findlay, Sir Edmund, Bt., Home Farm, Aberlour, Banffshire, "Equiposa 7th of Ballintomb" (110,947).
3rd	No. 152	Forteviot, Lord, of Dupplin, Dupplin Castle, Perthshire, "Rosa 4th of Ballintomb" (110,954).
4th	No. 155	Marshall & Mitchell, Bleaton, Blairgowrie, "Jelta of Bleaton" (112,961).
V	No. 159	Russell, G. H., of The Burn, Glenesk, Brechin, "Proud Bayuda of The Burn" (113,590).
H	No. 154	Honeyman, R. Wemyss, Derculich, Strathtay, Perthshire, "Blooming Maid of Derculich" (112,324).
C	No. 149	Atkinson, Captain F. B., Gallowhill, Morpeth, Northumberland, "Eugene of Gallowhill" (111,026).
C	No. 160	Strathmore Estates, Glamis, Angus, "Effie 3rd of Balvack" (111,628).

GALLOWAY.

PRESIDENT'S CHAMPION MEDAL
for best Galloway Animal.

No. 166 Biggar, Walter, Grange Farm, Castle Douglas, "Flashlight of Castle Milk" (20,114).

Reserve—No. 168 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, "Ideal of Castle Milk" (20,113).

Dr Gillespie Memorial Challenge Trophy, value £50, *for best Galloway Animal in the Breeding Classes, breeding animals shown as "Extra Stock" eligible to compete.* Presented by the Galloway Cattle Society of Great Britain and Ireland.

No. 166 Biggar, Walter, Grange Farm, Castle Douglas, "Flashlight of Castle Milk" (20,114).

Silver Challenge Cup, value £50, *for best animal of the sex opposite to that of the winner of the Dr Gillespie Memorial Challenge Trophy, "Extra Stock" eligible to compete.* Presented by the Galloway Cattle Society to commemorate the Hundredth Show.

No. 172 Buccleuch Estates, Ltd., Holestane, Thornhill, Dumfriesshire, "Musk Rose of Drumlanrig" (34,935).

Breeder of best Bull of any age in Classes 19 *to* 21 (*"Extra Stock" not eligible to compete*)—The Silver Medal.

No. 166 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie.

CLASS 19. BULL, born before 1st December 1934.—PREMIUMS, £15, £10, £5, and £3.

1st No. 164 Sinclair, Lady, Knocknalling, Dalry, Castle Douglas, "Jamie of Tullichewan" (18,805).
2nd No. 162 Carlyle, Thomas, Milnholm, Langholm, Dumfriesshire, "Grange Jester" (17,251).
3rd No. 163 M'Kill, William, Mitchellhill, Broughton, Biggar, "Grange Optimist" (19,353).

CLASS 20. BULL, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £15, £10, £5, and £3.

1st No. 166 Biggar, Walter, Grange Farm, Castle Douglas, "Flashlight of Castle Milk" (20,114).
2nd No. 168 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, "Ideal of Castle Milk" (20,113).
3rd No. 167 Buccleuch Estates, Ltd., Holestane, Thornhill, Dumfriesshire, "Avenger of Drumlanrig" (19,921).

CLASS 21. BULL, born on or after 1st December 1935.—PREMIUMS, £12, £8, £4, and £2.

1st No. 170 Graham, Robert, Chapel of Logan, Canonbie, "Camp Follower of Gilkerscleugh" (20,619).

CLASS 22. COW, in Milk, born before 1st December 1934.—PREMIUMS, £12, £8, £4, and £2.

1st No. 172 Buccleuch Estates, Ltd., Holestane, Thornhill, Dumfriesshire, "Musk Rose of Drumlanrig" (34,935).
2nd No. 171 Anderson, James Scott, Tullichewan, Alexandria, Dumbartonshire, "Marchioness of Tullichewan" (34,774).
3rd No. 174 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, "Lilac of Castle Milk" (33,728).
4th No. 176 Graham, Robert, Chapel of Logan, Canonbie, "Logan Lady 33rd" (34,420).
V No. 175 Duncan, Arthur B., Gilchristland, Closeburn, Dumfriesshire, "Kirtleton Bonnie Jean" (32,252).
H No. 177 Kennedy-Moffat, W., Auchencheyne, Moniaive, Dumfriesshire, "Tibbie 2nd of Lochurr" (33,753).

CLASS 23. COW or HEIFER, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 181 Duncan, Arthur B., Gilchristland, Closeburn, Dumfriesshire, Heifer, "Ruby of Gilchristland" (37,178).
2nd No. 178 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, Heifer, "Baroness of Castle Milk" (37,383).
3rd No. 189 Paterson, R. Jardine, Balgray, Lockerbie, Heifer, "Judith 2nd of Balgray" (37,396).
4th No. 186 Graham, Robert, Chapel of Logan, Canonbie, Heifer, "Logan Lady 44th" (37,309).
V No. 190 Paterson, R. Jardine, Balgray, Lockerbie, Heifer, "Culmark Nannie 2nd" (37,250).
H No. 184 Gourlay Farming Co., The Ford, Tynron, Dumfriesshire, Heifer, "Favourite 7th of Kirkland" (37,302).
C No. 185 Graham, C. E., Bogrie, Canonbie, Heifer, "Glenzier Lady 17th" (37,306).
C No. 192 Sinclair, Lady, Knocknalling, Dalry, Castle Douglas, Heifer, "Gerontia of Blawquhairn" (37,698).
C No. 183 Gourlay Farming Co., The Ford, Tynron, Dumfriesshire, Heifer, "Moss Rose 2nd of Kirkland" (37,291).
C No. 182 Duncan, Arthur B., Gilchristland, Closeburn, Dumfriesshire, Heifer, "Fashion 3rd of Gilchristland" (37,183).

CLASS 24. HEIFER, born on or after 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 201 Duncan, Arthur B., Gilchristland, Closeburn, Dumfriesshire, "Ewanston Olive" (38,086).
2nd No. 204 Graham, C. E., Bogrie, Canonbie, "Glenzier Lady 18th" (38,141).
3rd No. 203 Gourlay Farming Co., The Ford, Tynron, Dumfriesshire, "Flirt 6th of Kirkland" (38,130).
4th No. 209 Paterson, R. Jardine, Balgray, Lockerbie, "Florence 3rd of Balgray" (38,227).

V No. 197 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, " Annie 7th of Castle Milk " (38,210).

H No. 207 M'Kill, William, Mitchellhill, Broughton, Biggar, " Lizzie 2nd of Mitchellhill " (38,449).

C No. 200 Duncan, Arthur B., Gilchristland, Closeburn, Dumfriesshire, " Nanette of Gilchristland " (38,005).

C No. 202 Gourlay Farming Co., The Ford, Tynron, Dumfriesshire, " Robina 2nd of Kirkland " (38,129).

C No. 196 Buccleuch Estates, Ltd., Holestane, Thornhill, Dumfriesshire, " Nuthatch of Drumlanrig " (37,879).

BELTED GALLOWAY.

PRESIDENT'S CHAMPION MEDAL
for best Belted Galloway Animal.

No. 211 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, " Mark Advocate " (1085 B).

Reserve—No. 221 Brown, J. Douglas, Corseyard, Kirkcudbright, " Knockbrex Mavis " (3432 B).

Knockbrex Challenge Cup, value £50, *for the best Belted Galloway Animal, " Extra Stock " eligible to compete.* This Cup was presented by Mrs Brown, Kirkbrex, Glasgow, for the best Belted Galloway animal registered in the Dun and Belted Galloway Cattle Breeders' Association Herd-Book, entered in any of the breeding classes, at the Show at which it may be competed for.

No. 211 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, " Mark Advocate " (1085 B).

The Ian Hamilton Silver Challenge Cup, value £50, *for the best Belted Galloway Animal of the sex opposite to that of the winner of the Knockbrex Challenge Cup, " Extra Stock " eligible to compete.* The winning animal to be registered or eligible for registration in the Dun and Belted Galloway Herd-Book. This Cup was presented by General Sir Ian Hamilton, G.C.B.

No. 221 Brown, J. Douglas, Corseyard, Kirkcudbright, " Knockbrex Mavis " (3432 B).

Breeder of best Bull in Classes 25 *and* 26 (" *Extra Stock* " *not eligible to compete*)—The Silver Medal.

No. 211 Graham, Robert, Auchengassel, Twynholm.

CLASS 25. BULL, born before 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 211 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Mark Advocate" (1085 B)
2nd No. 210 Hamilton, General Sir Ian, G.C B , 1 Hyde Park Gardens, London, "Makerstoun Olly II." (1133 B).

CLASS 26. BULL, born on or after 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 212 Birnie, A., Wellbank, Peterhead, "Makerstoun Gay Gordon" (1163 B).
2nd No. 215 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Gartmore Noel" (1147 B).
3rd No. 213 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Neptune" (1141 B).
4th No. 214 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Gartmore Marsden" (1145 B).

CLASS 27. COW or HEIFER, born before 1st December 1934, in Milk or in Calf; if in calf and not in milk, to calve on or before 1st December of the year of the Show.—PREMIUMS, £10, £5, £3, and £2.

1st No. 220 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, Cow, "Gartmore Christian III." (3220 B).
2nd No. 216 Brown, J. Douglas, Corseyard, Kirkcudbright, Cow, "Knockbrex Jade" (3084 B).
3rd No. 218 Hamilton, General Sir Ian, G.C.B., 1 Hyde Park Gardens, London, Cow, "Lullenden Etty" (3418 B).
4th No. 219 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, Cow, "Gartmore Helen I." (1322 B).
V No. 217 Hamilton, General Sir Ian, G.C.B., 1 Hyde Park Gardens, London, Cow, "Shenley Barbara" (1682 B).

CLASS 28. HEIFER, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 221 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Mavis" (3432 B).
2nd No. 224 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Gartmore Winifred VI." (3462 B).
3rd No. 225 Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Gartmore Mary VIII." (3460 B).
4th No. 222 Hamilton, General Sir Ian, G.C.B., 1 Hyde Park Gardens, London, "Lullenden Dainty" (3586 B).
V No. 223 Hamilton, General Sir Ian, G.C.B., 1 Hyde Park Gardens, London, "Makerstoun Biddy" (3594 B).

CLASS 29. HEIFER, born on or after 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 228	Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Gartmore Dandy IX." (3636 B).
2nd No. 229	Nalc Co., Ltd. (per Sir August Cayzer, Bt.), Estates Office, Gartmore, Perthshire, "Gartmore Winifred VIII." (3660 B).
3rd No. 227	Hamilton, General Sir Ian, G.C.B., 1 Hyde Park Gardens, London, "Lullenden Beauty II." (2702 B).
4th No. 226	Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Nymph" (3626 B).

HIGHLAND.

PRESIDENT'S CHAMPION MEDAL for best Highland Animal.

No. 230 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Prionnsa Buidhe II. of Kilchamaig" (3795).

Reserve—No. 257 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "Laochag Chliniteach" (11,072).

Perpetual Victory Challenge Cup, approximate value 50 Guineas, *for the best Animal in the Male Classes, "Extra Stock" eligible to compete.* Given by the Highland Cattle Society of Scotland.

No. 230 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Prionnsa Buidhe II. of Kilchamaig" (3795).

Breeder of best Bull in Classes 30 *to* 32 (*"Extra Stock" not eligible to compete*)—The Silver Medal.

No. 230 Turner, Miss, Kilchamaig, Whitehouse, Argyll.

CLASS 30. BULL, born before 1st December 1934.—PREMIUMS, £15, £10, £5, and £3.

1st No. 230	Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Prionnsa Buidhe II. of Kilchamaig" (3795).

CLASS 31. BULL, born on or after 1st December 1934, and before 1st December 1935.—Premiums, £15, £10, £5, and £3.

1st No. 234 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "An Morair of Killundine" (3843).
2nd No. 232 Dalgleish, James P., of Barbreck, Lochgilphead, Argyll, "An-Ceatharnach of Barbreck" (3840).
3rd No. 235 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "Raonull of Killean" (3857).

CLASS 32. BULL, born on or after 1st December 1935.—Premiums, £12, £8, £4, and £2.

1st No. 236 Dalgleish, James P., of Barbreck, Lochgilphead, Argyll, "Leachy of Barbreck" (3923).
2nd No. 237 Dunlop, Miss, of Shieldhill, Biggar, "Alisdair of Quothquan" (3932).
3rd No. 239 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "An Fear Molach of Killundine" (3928).
4th No. 238 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Moileanach of Killundine" (3927).

Perpetual Victory Challenge Cup, approximate value 35 Guineas, *for the best Animal in the Female Classes, "Extra Stock" eligible to compete.* Given by the Highland Cattle Society of Scotland.

No. 257 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "Laochag Chliniteach" (11,072).

CLASS 33. COW, of any age, with Calf at foot.—Premiums, £12, £8, £4, and £2.

1st No. 245 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Molag Ruadh II. of Killundine" (10,599).
2nd No. 243 Carnegie, Mrs, of Stronvar, Strathyre, Perthshire, "Princess Alma XVI. of Stronvar" (10,583).
3rd No. 247 Southesk Estates Co., Haughs of Kinnaird, Brechin, "Lady Mairi II." (10,722).
4th No. 244 Currie, John J., Cuilfail, Kilmelford, by Oban, "Riabhach Mhollach III. of Milton" (10,766).
V No. 248 Thomson, Misses S. W. and B. L., of Glenpark, Balerno, Midlothian, "Capleadh XIV. of Achnacloich" (10,601).
H No. 242 Carnegie, Mrs, of Stronvar, Strathyre, Perthshire, "Annag Bhoidheach VIII. of Stronvar" (10,382).
C No. 246 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, Perthshire, "Shuna V. of Errol" (10,267).

CLASS 34. HEIFER, born on or after 1st December 1933, and before 1st December 1934.—Premiums, £10, £5, £3, and £2.

1st No. 257 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "Laochag Chliniteach" (11,072).
2nd No. 254 Morrison, John G., of Islay, Islay House, Bridgend, Isle of Islay, "Daoimen Ile" (10,840).

3rd No. 258 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "Ashie Ruadh of Foreland" (10,954).

4th No. 255 Southesk Estates Co., Haughs of Kinnaird, Brechin, "Cassandra" (11,013).

V No. 249 Carnegie, Mrs, of Stronvar, Strathyre, Perthshire, "Daoimon XIV. of Stronvar" (10,937).

H No. 251 Dunlop, Miss, of Shieldhill, Biggar, "Maireared of Quothquan" (10,805).

C No. 252 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Una Bhuidhe V. of Killundine" (10,818).

C No. 253 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, Perthshire, "Fiona Maid II. of Errol" (10,854).

C No. 250 Dunlop, Miss, of Shieldhill, Biggar, "Sidonia of Quothquan" (10,806).

CLASS 35. HEIFER, born on or after 1st December 1934, and before 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 264 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, Perthshire, "Seonaid of Errol" (10,920).

2nd No. 268 Thomson, Misses S. W. and B. L., of Glenpark, Balerno, Midlothian, "Cairn of Glendarroch" (10,923).

3rd No. 269 Thomson, Misses S. W. and B. L., of Glenpark, Balerno, Midlothian, "Kip of Glendarroch" (10,922).

4th No. 261 Dalgleish, James P., of Barbreck, Lochgilphead, Argyll, "Lady Buidhe of Barbreck" (10,977).

V No. 262 Dunlop, Miss, of Shieldhill, Biggar, "Laochag III. of Quothquan" (10,907).

H No. 266 Morrison, John G., of Islay, Islay House, Bridgend, Isle of Islay, "Baravalla Laghach Ile II." (10,989).

C No. 265 Mansfield Estates, Balboughty, Perth, "Lady Sheila III." (11,111).

C No. 263 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Donnag Riabhach II. of Killundine" (11,026).

C No. 260 Currie, John J., Cuilfail, Kilmelford, by Oban, "Proisag Caoimhneil of Maolachy" (11,002).

C No. 259 Carnegie, Mrs, of Stronvar, Strathyre, Perthshire, "Princess Alma XVII." (11,091).

CLASS 36. HEIFER, born on or after 1st December 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 278 Morrison, John G., of Islay, Islay House, Bridgend, Isle of Islay, "Capleadh Ile" (11,127).

2nd No. 276 Lees-Milne, Mrs, Ardachy, Connel, Argyll, "Annag Ruadh of Killundine" (11,016).

3rd No. 272 Dalgleish, James P., of Barbreck, Lochgilphead, Argyll, "Maighdean Buidhe of Barbreck" (11,120).

4th No. 279 Southesk Estates Co., Haughs of Kinnaird, Brechin, "Madam Corrina II." (11,109).

V No. 275 Dunlop, Miss, of Shieldhill, Biggar, "Princess Geralda II. of Quothquan" (11,108).

H No. 274 Dunlop, Miss, of Shieldhill, Biggar, "Sidonia II. of Quothquan" (11,106).

C No. 277 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, Perthshire, "Orag V. of Errol" (11,124).

AYRSHIRE.

CONDITIONS.

1. To be eligible for competition in the Ayrshire Section cows must have an authenticated milk yield, and younger females (including cows which have not completed their first lactation) and bulls an authenticated milking pedigree, of a definite minimum amount.
2. The minimum amount referred to shall be as follows, calculated on the basis of a period between calvings of 52 weeks, and 3.8 per cent of butter fat :—
   - (*a*) Cows which have completed two or more lactations—700 gallons.
   - (*b*) Cows which have completed only one lactation—600 gallons.
   - (*c*) Younger females and bulls—an authenticated milking pedigree for dam and dam of sire on a similar basis.
3. In the case of cows with two or more lactations the record lodged may be that for any year the Exhibitor may select.

PRESIDENT'S CHAMPION MEDAL *for best Ayrshire Animal.*

No. 281 Clark, John, Dunrod Farm, Inverkip, "Dunrod Pearl 11th" (48,169).

Reserve—No. 288 M'Alister, James, Meikle Kilmory, Rothesay, "Meikle Kilmory Moss Rose 10th" (30,069).

Renfrewshire Perpetual Gold Challenge Cup, value £250, *for best Ayrshire Animal, "Extra Stock" eligible to compete.* This Cup, along with an endowment of £500, was provided from money collected in Renfrewshire by the late Provost Muir M'Kean of Paisley, and is in commemoration of the Society's first Show in the county of Renfrew in 1913.

No. 281 Clark, John, Dunrod Farm, Inverkip, "Dunrod Pearl 11th" (48,169).

Reserve—No. 288 M'Alister, James, Meikle Kilmory, Rothesay, "Meikle Kilmory Moss Rose 10th" (30,069).

Cowhill Champion Cup, approximate value £30, *for best Animal of the Ayrshire breed, entered with a number in the Herd-Book.* Presented by the late Major Henry Keswick, Cowhill Tower, Dumfries, to the Ayrshire Cattle Herd-Book Society, to be competed for annually at the Shows of the Highland and Agricultural Society of Scotland. Messrs James Howie & Sons, Muirside, Dumfries, who won this Cup outright in 1934, have kindly re-presented the Cup ,to the Society for competition on the same conditions as formerly.

No. 281 Clark, John, Dunrod Farm, Inverkip, "Dunrod Pearl 11th" (48,169).

Special Prize of £10 *for the best Female Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book prior to 1st June 1937. "Extra Stock" eligible to compete.* Given by the Ayrshire Cattle Herd-Book Society.

No. 281 Clark, John, Dunrod Farm, Inverkip, "Dunrod Pearl 11th" (48,169).

CLASS 37. COW, in Milk, born before 1934.—PREMIUMS, £12, £8, £4, and £2.

1st No. 281 Clark, John, Dunrod Farm, Inverkip, "Dunrod Pearl 11th" (48,169).
2nd No. 282 Clark, John, Dunrod Farm, Inverkip, "Dunrod Susan 5th" (48,174).
3rd No. 285 Turner, James, Loaninghead, Balfron Station, "Loaninghead Madge" (B 7027).
4th No. 283 M'Alister, Duncan, Nether Ardroscadale, Rothesay, "Ardroscadale Pride 2nd" (42,780).

EXTRA STOCK.

The following received an award of £10:—

No. 288 M'Alister, James, Meikle Kilmory, Rothesay, "Meikle Kilmory Moss Rose 10th" (30,069).

CLASS 38. COW, in Milk, born on or after 1st January 1934.—PREMIUMS, £10, £7, £3, and £2.

1st No. 319 Clark, John, Dunrod Farm, Inverkip, "Dunrod Charm 4th" (65,038).
2nd No. 289 Ardgowan Estates, Ltd., Bankfoot, Inverkip, "Ardgowan Jazz" (64,130).
3rd No. 298 Turner, James, Loaninghead, Balfron Station, "Loaninghead Beauty 5th" (55,933).
4th No. 297 Tullibody Land Co., Ltd., Ditch Farm, Cambus, "Tullibody Duchess 3rd" (A 402).
V No. 291 Clark, John, Dunrod Farm, Inverkip, "Dunrod Violet 8th" (60,761).
H No. 290 Blair, William C., Dykehead Farm, Carmunnock, "Dykehead Beatrice."
C No. 299 Turner, James, Loaninghead, Balfron Station, "Loaninghead Perfect Lady" (A 398).
C No. 294 M'Alister, James, Meikle Kilmory, Rothesay, "Meikle Kilmory Lady Jean 5th" (70,439).

CLASS 39. COW, of any age, in Calf, and due to calve before 1st December of the year of the Show.—PREMIUMS, £10, £7, £3, and £2.

1st No. 286 Turner, James, Loaninghead, Balfron Station, "Loaninghead Zena" (B 6998).
2nd No. 301 Clark, John, Dunrod Farm, Inverkip, "Dunrod Snowflake 6th" (60,759).
3rd No. 293 M'Alister, James, Meikle Kilmory, Rothesay, "Meikle Kilmory Essence 5th" (57,031).
4th No. 302 Drummond, John N., Bargower, Hurlford, "Bargower Cherry Fine 13th" (37,909).
V No. 306 Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder, "Drumfork Stately 10th" (39,913).
H No. 300 Blair, William C., Dykehead Farm, Carmunnock, "Dykehead White Bud" (53,414).

CLASS 40. HEIFER, born on or after 1st June 1934, in Calf, and due to calve before 1st December of the year of the Show.—PREMIUMS, £10, £7, £3, and £2.

1st	No. 316	Semple, Robert, Netherton, Dalrymple, " Netherton Bloomer 2nd " (69,094).
2nd	No. 308	Ardgowan Estates, Ltd., Bankfoot, Inverkip, " Ardgowan Carlotta " (64,109).
3rd	No. 307	Ardgowan Estates, Ltd., Bankfoot, Inverkip, " Ardgowan Comely " (64,116).
4th	No. 312	Fleming, William, Auldton, Ashgill, Dalserf, Lanarkshire, " Auldton Princess Marina " (67,234).
V	No. 313	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder, " Strathallan Sly Miss " (74,963).

CLASS 41. HEIFER, born in 1935.—PREMIUMS, £10, £5, £3, and £2

1st	No. 318	Ardgowan Estates, Ltd., Bankfoot, Inverkip, " Ardgowan Geneva " (64,124).
2nd	No. 323	Tullibody Land Co., Ltd., Ditch Farm, Cambus, " Tullibody Pearl 3rd " (71,060).
3rd	No. 324	Tullibody Land Co., Ltd., Ditch Farm, Cambus, " Tullibody Chestnut 3rd " (71,033).
4th	No. 320	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder, " Hollybush Gertie 4th " (63,416).

CLASS 42. HEIFER, born in 1936.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 333	Semple, Robert, Netherton, Dalrymple, " Netherton Snowdrop " (75,805).
2nd	No. 331	Montgomerie, A. W., Westburn Farm, Cambuslang, " Lessnessock Nanny Hope 4th " (71,743).
3rd	No. 329	Logan, W. & J., Burton Farm, Ayr, " Burton Charm."
4th	No. 327	Barr, Allan, Hobsland, Monkton, Ayrshire, " Hobsland Snow 10th."
V	No. 326	Ardgowan Estates, Ltd., Bankfoot, Inverkip, " Ardgowan Caroline " (76,198).
H	No. 334	Wemyss, Lady Victoria, Wemyss Castle Home Farm, Wemyss Castle, East Wemyss, " Wemyss Hughina " (71,614).

Breeder of best Bull of any age in Classes 43 *to* 45 (" *Extra Stock* " *not eligible to compete*)—The Silver Medal.

No. 338 Watson, Alexander, Barboigh, Mauchline.

Special Prize of £10 *for the best Male Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book prior to 1st June* 1937. " *Extra Stock* " *eligible to compete.* Given by the Ayrshire Cattle Herd-Book Society.

No. 338 Wallace, David, Auchenbrain, Mauchline, " Barboigh Revelenta " (35,342).

CLASS 43. BULL, born before 1935.—PREMIUMS, £12, £8, £4, and £2.

1st No. 338 Wallace, David, Auchenbrain, Mauchline, "Barboigh Revelenta" (35,342).
2nd No. 339 Young, William, & Sons, Dalmoak, Dumbarton, "Drumfork Standard" (34,739).
3rd No. 337 Dunlop, Quintin, Greenan, Ayr, "Low Milton Marksman" (36,112).
4th No. 336 Buchanan, Andrew, Burnside of Balhaldie, Braco, Perthshire, "Lyonston Crown" (33,822).

CLASS 44. BULL, born in 1935.—PREMIUMS, £10, £7, £3, and £2.

1st No. 341 Templeton, Thomas, Hillhead, Sorn, Mauchline, "Howie's Mascot" (35,995).
2nd No. 342 Wallace, David, Auchenbrain, Mauchline, "Lessnessock Director" (37,150).
3rd No. 340 Barr, Allan, Hobsland, Monkton, Ayrshire, "Hobsland Fashion Plate" (35,752).

CLASS 45. BULL, born in 1936 —PREMIUMS, £8, £5, £3, and £2.

1st No. 345 Montgomerie, A. W., Westburn Farm, Cambuslang, "Barboigh Special" (38,032).

BRITISH FRIESIAN.

PRESIDENT'S CHAMPION MEDAL for best British Friesian Animal.

No. 400 Houston, John, Selvieland, Paisley, "Royal (imported 1936) Hiltkees" (46,907).

Reserve—No. 407 Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington (imported 1936) Leo" (46,237).

The MacRobert Champion Silver Bell, value 50 Guineas, *for the best Animal in the British Friesian Classes, registered in or eligible for entry in the British Friesian Cattle Society's Herd-Book. "Extra Stock" eligible to compete.* Presented by Lady Rachel Workman MacRobert, Douneside, Tarland.

No. 400 Houston, John, Selvieland, Paisley, "Royal (imported 1936) Hiltkees" (46,907).

Silver Challenge Cup, value 50 Guineas, *for the best Group of three animals. "Extra Stock" eligible to compete.* Given by the British Friesian Cattle Society.

Nos. 352, 356, 407 Weightman, Albert, Middle Herrington Farm, Sunderland.

Champion Prize of £5 given by the British Friesian Cattle Society *for the best Female Animal exhibited. "Extra Stock" eligible to compete.*

No 347 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigiemains Lady Evelyn" (176,764 R M P, R M)

CLASS 46. COW, in Milk, born in or before 1933—PREMIUMS, £12, £8, £4, and £2

1st No. 352 Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington Naressa" (179,298 R M)
2nd No. 350 MacRobert, Trustees of Sir Alasdair W, Bt, Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, "Douneside (imported 1936) Aaltje" (199,808)
3rd No 348 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Ella" (148,344)
4th No. 353 Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington Gentle Nanette" (179,282).
V No 351 Spence, Andrew, Commieston, Montrose, "Commieston Jagirl" (154,904 R.M).

CLASS 47. COW, in Calf, and not in Milk, born in or before 1933.—PREMIUMS, £10, £5, £3, and £2

1st No. 347 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigiemains Lady Evelyn" (176,764 R.M.P., R.M).
2nd No 356 Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington Maureen" (168,326 R M).
3rd No. 354 Easson, George, Sheephousewell Farm, Dunfermline, "Sheephousewell Akke 2nd" (172,188).

EXTRA STOCK.

The following received an award of £3.—

No 357 Logan, James, Powis Mains, Stirling, "Hattrick Nora-Lin" (72,114 R.M L).

CLASS 48. COW, in Milk, born in 1934 or 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 361 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Marlene" (191,106).
2nd No. 362 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Cynthia" (191,092)
3rd No. 360 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigiemains Doris" (187,756).
4th No. 364 Spence, Andrew, Commieston, Montrose, "Chellaston (imported 1936) Leeuwarder" (198,378).
V No. 365 Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington Onyx" (190,278 P.I.).
H No. 366 Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington Osprey" (190,300).

CLASS 49. HEIFER, born in 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 376 MacRobert, Trustees of Sir Alasdair W., Bt., Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, " Douneside Lilac " (199,812).
2nd No. 372 Hunter, J. G., Horn, Errol, Perthshire, " Horn Amelia " (201,864).
3rd No. 377 Pathhead & Sinclairtown Reform Co-operative Society, Ltd., 102 Commercial Street, Kirkcaldy, " Abden Hazel " (196,284).
4th No. 371 Glentanar, Lord, Home Farm, Glen Tanar, Aboyne, Aberdeenshire, " Glentanar Burcella " (200,932).
V No. 370 Glentanar, Lord, Home Farm, Glen Tanar, Aboyne, Aberdeenshire, " Glentanar Querette " (200,938).
H No. 373 Innes, James C., Dunscroft, Gartly, Aberdeenshire, " Donside Pauline " (199,764).
C No. 368 Christison, John, Crossveggate, Milngavie, " Crossveggate Bessie 3rd " (199,278).
C No. 379 Weightman, Albert, Middle Herrington Farm, Sunderland, " Herrington Pansy " (201,682).

CLASS 50. HEIFER, born in 1936, before 1st July.—PREMIUMS, £10, £5, £3, and £2.

1st No. 387 Kilpatrick, James, Craigie Mains, Kilmarnock, " Craigiemains Beauty 6th " (211,056).
2nd No. 383 Christison, John, Crossveggate, Milngavie, " Crossveggate Mary " (211,268).
3rd No. 381 Allan, Thomas D., Parkhouse, Biggar, " Parkhouse Ruby 4th " (216,774).
4th No. 390 Weightman, Albert, Middle Herrington Farm, Sunderland, " Herrington Mayflower " (213,784).
V No. 385 Glentanar, Lord, Home Farm, Glen Tanar, Aboyne, Aberdeenshire, " Glentanar Jouringa " (212,930).
H No. 388 MacRobert, Trustees of Sir Alasdair W., Bt., Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, " Douneside Muriel " (211,828).
C No. 380 Allan, Thomas D., Parkhouse, Biggar, " Parkhouse Anna " (216,760 P.I.).
C No. 384 Glentanar, Lord, Home Farm, Glen Tanar, Aboyne, Aberdeenshire, " Glentanar Meilectra " (212,932).
C No. 382 Christison, John, Crossveggate, Milngavie, " Crossveggate Flora 2nd " (211,260).

CLASS 51. HEIFER, born in 1936, on or after 1st July.—PREMIUMS, £10, £5, £3, and £2.

1st No. 397 Spence, Andrew, Commieston, Montrose, " Commieston Paula Montez " (210,806).
2nd No. 395 MacRobert, Trustees of Sir Alasdair W., Bt., Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, " Douneside Beauty " (211,806).
3rd No. 394 MacRobert, Trustees of Sir Alasdair W., Bt., Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, " Douneside Primrose " (211,830).
4th No. 392 Macaulay, Andrew, Lathalmond Farm, Dunfermline, " Lathalmond Myrene " (214,606).
V No. 393 M'Nair, Samuel, Merrymouth Farm, Dunlop, Ayrshire, " Moy Folly " (216,094).
H No. 391 Christison, John, Crossveggate, Milngavie, " Crossveggate Rubina 2nd " (211,274).
C No. 396 Spence, Andrew, Commieston, Montrose, " Commieston Penny Lass " (210,808).

Breeder of Best Bull of any age in Classes 52 *to* 54 (*" Extra Stock " not eligible to compete*)—The Silver Medal.

No. 400 Okma, B. D., Dijken, Woudsend, Friesland, Holland.

Champion Prize of £5 given by the British Friesian Cattle Society *for the best Male Animal exhibited. " Extra Stock " eligible to compete.*

No. 400 Houston, John, Selvieland, Paisley, " Royal (imported 1936) Hiltkees " (46,907).

CLASS 52. BULL, born in or before 1934.—PREMIUMS, £12, £8, £4, and £2.

1st No. 400 Houston, John, Selvieland, Paisley, " Royal (imported 1936) Hiltkees " (46,907).
2nd No. 401 Pathhead & Sinclairtown Reform Co-operative Society, Ltd., 102 Commercial Street, Kirkcaldy, " Loirston King 2nd " (44,317).
3rd No. 403 Young, William, Arradoul Mains, Buckie, Banffshire, " Craigiemains Lord Roberts " (38,725).
4th No. 402 Prentice, John W., Craigrie Farm, Clackmannan, " Glentanar Jeanbar " (40,527).

CLASS 53. BULL, born in 1935.—PREMIUMS, £10, £5, £3, and £2.

1st No. 407 Weightman, Albert, Middle Herrington Farm, Sunderland, " Herrington (imported 1936) Leo " (46,237).
2nd No. 405 Johnston, Thomas, & Son, Standalane, Falkirk, " Standalane (imported 1936) Jongbert " (47,029).
3rd No. 406 MacRobert, Trustees of Sir Alasdair W., Bt., Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, " Douneside Lartinique " (45,843).

CLASS 54. BULL, born in 1936.—PREMIUMS, £10, £5, £3, and £2.

1st No. 411 MacRobert, Trustees of Sir Alasdair W., Bt., Douneside, Melgum and Cromar Estate Office, Tarland, Aboyne, Aberdeenshire, " Douneside Aaltje Hollander P.I."
2nd No. 409 Kilpatrick, James, Craigie Mains, Kilmarnock, " Craigiemains Delectable."
3rd No. 408 Hunter, J. G., Horn, Errol, Perthshire, " Horn Harbinger."
4th No. 410 Logan, James, Manor Neuk Farm, Stirling, " Powis Butteranic."
V No. 412 Pathhead & Sinclairtown Reform Co-operative Society, Ltd., 102 Commercial Street, Kirkcaldy, " Parkhouse Wizard P.I."

HORSES

CLYDESDALE STALLION AND COLT.

PRESIDENT'S CHAMPION MEDAL *for best Clydesdale Stallion or Colt.*

No. 443 Clark, Alexander, Strathore House, Thornton, "Strathore Imperial."

Reserve—No. 430 Clark, James, Windlaw, Carmunnock, "Windlaw Aristocrat" (23,010).

Fife and Kinross Perpetual Gold Challenge Cup, value £200, *for best Clydesdale Stallion or Colt. "Extra Stock" eligible to compete.* This Cup, along with an endowment of £400, was subscribed for by the Counties of Fife and Kinross in commemoration of the Society's first Show at Cupar, Fife, in 1912.

No. 443 Clark, Alexander, Strathore House, Thornton, "Strathore Imperial."

Reserve—No. 430 Clark, James, Windlaw, Carmunnock, "Windlaw Aristocrat" (23,010).

Cawdor Challenge Cup, value 50 Guineas, *for best Clydesdale Stallion or Colt. "Extra Stock" eligible to compete.* This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland.

No. 443 Clark, Alexander, Strathore House, Thornton, "Strathore Imperial."

Breeder of best Male Animal of any age in Classes 55 *to* 58 (*"Extra Stock" not eligible to compete*)—The Silver Medal.

No. 443 Beck, George M., Fremington, Brougham, Penrith.

William Taylor Memorial Prize of £10 and Certificate *to the Breeder of the best Clydesdale Colt entered in Classes* 57 *and* 58. Given by William Taylor Memorial Committee.

No. 443 Beck, George M., Fremington, Brougham, Penrith.

CLASS 55. STALLION, born before 1934.—PREMIUMS, £20, £15, £10, and £4.

1st No. 416 Reith, Miss E. M., Kennerty, Peterculter, Aberdeenshire, "Renown" (21,525).
2nd No. 418 Templeton, T. & M., Sandyknowe, Kelso, "Grand National" (22,474).

CLASS 56. ENTIRE COLT, born in 1934.—PREMIUMS, £20, £15, £10, and £4.

1st No. 419 Adams, David, Auchencraig, Dumbarton, "Dee's Lord Lyon" (22,902).
2nd No. 424 Morton, Robert R., Balquharrage, Lennoxtown, "Balisha" (22,584).

CLASS 57. ENTIRE COLT, born in 1935.—PREMIUMS, £20, £15, £10, and £4.

1st No. 430 Clark, James, Windlaw, Carmunnock, "Windlaw Aristocrat" (23,010).
2nd No. 440 Templeton, T. & M., Sandyknowe, Kelso, "Loyalist" (22,951).
3rd No. 433 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Handsome Lad" (22,888).
4th No. 428 Clark, Alexander, Strathore House, Thornton, "Strathore Guard" (22,999).
V No. 429 Clark, Allan, Woodbank, Windygates, "Woodbank Speciality" (23,016).
H No. 438 Sleigh, John P., & Sons, St John's Wells, Fyvie, "Ewenway."
C No. 426 Adams, David, Auchencraig, Dumbarton, "Strathore Emblem" (22,997).
C No. 432 Clark, Thomas, Muirtons, Perth, "Muirton Ideal" (22,960).
C No. 437 Morton, Robert R., Balquharrage, Lennoxtown, "Baldwin" (22,842).

CLASS 58. ENTIRE COLT, born in 1936.—PREMIUMS, £15, £9, £6, and £4.

1st No. 443 Clark, Alexander, Strathore House, Thornton, "Strathore Imperial."
2nd No. 442 Adams, David, Auchencraig, Dumbarton, "Nemesis."
3rd No. 458 Templeton, T. & M., Sandyknowe, Kelso.
4th No. 457 Templeton, T. & M., Sandyknowe, Kelso.
V No. 454 Murdoch, Henry, Balgreen, Hollybush, "Balgreen Royal Scot."
H No. 445 Gemmell, James, North Bankend, Coalburn, Lanarkshire, "Bankend Encore."
C No. 444 Dobie, John A. & Henry, Hitchell, Cummertrees, Annan, "Hitchell Banker."

CLYDESDALE GELDING.

Got by a Registered Clydesdale Stallion.

PRESIDENT'S CHAMPION MEDAL
for best Clydesdale Gelding.

No. 463 Clark, James, Windlaw, Carmunnock, "Walter."

Reserve—No. 466 Greig, Messrs, Housenrigg, Brayton, Aspatria, "Maxwell."

The Meiklem Gold Challenge Cup, value 110 Guineas, *for best Clydesdale Gelding. "Extra Stock" eligible to compete.* Given by Mr William Meiklem, Bennochy Park, Kirkcaldy.

No. 463 Clark, James, Windlaw, Carmunnock, "Walter."

Reserve—No. 466 Greig, Messrs, Housenrigg, Brayton, Aspatria, "Maxwell."

CLASS 59. GELDING, born before 1934.—PREMIUMS, £15, £9, £6, and £4.

1st	No. 463	Clark, James, Windlaw, Carmunnock, "Walter."
2nd	No. 466	Greig, Messrs, Housenrigg, Brayton, Aspatria, "Maxwell."
3rd	No. 465	Elder, Hugh, & Son, City Mills, Dunfermline, "Bob."
4th	No. 464	Clark, James, Windlaw, Carmunnock, "The Boss."
V	No. 459	Anderson, Sir Kenneth S., Bt., K.C.M.G., The Yair, Galashiels, "Blue Bird."
H	No. 461	Bowser, D. C., Argaty, Doune, "Willie."

CLASS 60. GELDING, born in 1934.—PREMIUMS, £15, £9, £6, and £4.

1st	No. 468	Clark, James, Windlaw, Carmunnock, "Sandy."
2nd	No. 472	Sleigh, A. & H., Mains of Tolquhon, Tarves, "The Miller."
3rd	No. 467	Anderson, Sir Kenneth S., Bt., K.C.M.G., The Yair, Galashiels, "The Sergeant-Major."
4th	No. 471	Roy, James, Ransfield, Ratho, Midlothian, "Victor."
V	No. 475	Wilson, John, Mains of Beath, Crossgates, Fife, "Robin."
H	No. 474	Vint, Wyndham T., Thorn Cottage, Wroot, Doncaster, "Harry."
C	No. 469	Dunfermline Co-operative Society, Ltd., Estate Office, Crossford, Dunfermline, "Bob."

CLASS 61. GELDING, born in 1935.—PREMIUMS, £15, £9, £6, and £4.

1st	No. 479	Wilson, William, Blackbyres, Barrhead, "Steel."
2nd	No. 477	Eadie, Ronald, Muirton, Stirling.
3rd	No. 478	Murdoch, James, Netherton, Renfrew, "Onward."
4th	No. 480	Wilson, William, Blackbyres, Barrhead, "Prince."

CLYDESDALE MARE AND FILLY.

PRESIDENT'S CHAMPION MEDAL for best Clydesdale Mare or Filly.

No. 535 M'Farlane, John, Bailielands, Auchterarder, "May."

Reserve—No. 504 Murray, Douglas D., The Dene, Seaham Harbour, Filly, "Seaham Ideal Lady."

Cawdor Challenge Cup, value 50 Guineas, *for best Clydesdale Mare or Filly, "Extra Stock" eligible to compete*. This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland.

No. 535 M'Farlane, John, Bailielands, Auchterarder, "May."

CLASS 62. MARE, of any age, with Foal at foot, or due to foal before 31st July 1937.—PREMIUMS, £20, £12, £7, and £4.

1st No. 482 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Nadine" (59,416).
2nd No. 489 Taylor, Robert, Milton Hall, Brampton Junction, Cumberland, "Milton June" (60,188).
3rd No. 486 Murray, Douglas D., The Dene, Seaham Harbour, "Seaham Ideal Queen."
4th No. 484 More, John, The Beild, Gargunnock, "Beild Tibby."
V No. 488 Stirling, John, Parkhead, Alloa, "Brunstane Ruby" (60,171).
H No. 490 Taylor, Robert, Milton Hall, Brampton Junction, Cumberland, "Queen o' Borgue."
C No. 485 More, William, Fourmerk, Kippen Station, "Fourmerk Princess" (58,195).
C No. 491 Watt, Robert, Todsbughts, Slamannan, "Buchan Ideal."
C No. 483 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Pamela" (59,415).

CLASS 63. YELD MARE, born before 1934.—PREMIUMS, £15, £9, £6, and £4.

1st No. 493 Park, Misses M. and J., Brunstane, Portobello, "Lindoris" (59,049).
2nd No. 494 Park, Misses M. and J., Brunstane, Portobello, "Brunstane Alice."
3rd No. 492 Anderson, W. L., Morphie, Montrose, "Morphie Modesty."
4th No. 495 Park, Misses M. and J., Brunstane, Portobello, "Collairnie Nannie" (62,742).

EXTRA STOCK.

The following received an award of £10 :—

No. 496 M'Dowall, George, Briarbrae, Stranraer, "Lucinda."

CLASS 64. YELD MARE or FILLY, born in 1934.—PREMIUMS, £15, £9, £6, and £4.

1st No. 504 Murray, Douglas D., The Dene, Seaham Harbour, Filly, "Seaham Ideal Lady."
2nd No. 500 Kerr, J. E., of Harviestoun, Dollar, Filly, "Harviestoun Nell."
3rd No. 497 Adams, David, Auchencraig, Dumbarton, Filly, "Dee's Sweet Esma."
4th No. 501 M'Dowall, George, Briarbrae, Stranraer, Filly, "Baroness."
V No. 499 Boadle, Archie, West End, Flimby, Maryport, Mare, "Opulence II."
H No. 502 MacLaren, A. & T., Drummore, Doune, Mare, "Drummore Sheena."
C No. 498 Barr, James, Dunsyre Mains, Carnwath, Filly, "Dunsyre Snowflake."

CLASS 65. FILLY, born in 1935.—PREMIUMS, £15, £9, £6, and £4.

1st	No. 520	Robson, J. T., Sewborwens, Penrith, Cumberland, " Countess of Lonsdale."
2nd	No. 514	Murdoch, Alexander, East Hallside, Cambuslang, Lanarkshire, " Titania."
3rd	No. 519	Reith, Miss E. M., Kennerty, Peterculter, Aberdeenshire, " Sunflower II."
4th	No. 516	Murdoch, Henry, Balgreen, Hollybush, " Balgreen Emblem."
V	No. 523	Taylor, Robert, Milton Hall, Brampton Junction, Cumberland, " Milton Jubilee."
H	No. 512	Dewar, Peter, 54 St Alban's Road, Edinburgh, " Lady Jean."
C	No. 521	Seymour, T., & Sons, Hylton Red House Farm, Southwick, Sunderland, " Hylton Pride."
C	No. 522	Sharp, T. Mercer, Bardrill, Blackford, " Bardrill Modesty."

CLASS 66. FILLY, born in 1936.—PREMIUMS, £15, £9, £6, and £4.

1st	No. 535	M'Farlane, John, Bailielands, Auchterarder, " May."
2nd	No. 525	Beck, George M., Fremington, Brougham, Penrith, " Divine Wind."
3rd	No. 532	Kilpatrick, James, Craigie Mains, Kilmarnock, " Craigie Moss Rose."
4th	No. 542	Sleigh, John P., & Sons, St John's Wells, Fyvie, " Melita."
V	No. 540	Murray, Douglas D., The Dene, Seaham Harbour, " Seaham Autumn Queen."
H	No. 537	Murdoch, Alexander, East Hallside, Cambuslang, Lanarkshire, " Rose Deeprose."
C	No. 536	M'Farlane, John, Bailielands, Auchterarder, " Dorothy."
C	No. 534	M'Dowall, George, Briarbrae, Stranraer, " Veronica."

SUFFOLK HORSES.

(FOR EXHIBITION ONLY.)

Per Suffolk Horse Society, Woodbridge, Suffolk.

The following were awarded the Silver Medal:—

No. 546	Walker, Dennis, Old Hall Farm, Trowse, Norwich, Stallion, " Holkham Pioneer " (6120).
No. 547	Walker, Dennis, Old Hall Farm, Trowse, Norwich, Stallion, " Wyverstone Monarch " (6058).

HUNTERS.

PRESIDENT'S CHAMPION MEDAL for best Hunter (Classes 67 to 73).

No. 584 Paton, Arthur, Whitehill, St Boswells, Gelding, "Bluebeard."

Reserve—No. 555 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, Gelding, "Red Hot" (2119).

Dumfries Centenary Silver Challenge Cup, value £100, *for best Hunter. "Extra Stock" not eligible to compete.* Presented by members of the Dumfriesshire Hunt in 1930 to commemorate the centenary of the Highland Society's first Show at Dumfries in 1830.

No. 584 Paton, Arthur, Whitehill, St Boswells, Gelding, "Bluebeard."

CLASS 67. HUNTER BROOD MARE, with Foal at foot, or due to foal before 31st July 1937.—PREMIUMS, £15, £7, and £3.

1st No. 549 Russell, Major George, of Kingsdale, Windygates, Fife, "Princess."
2nd No. 548 Currie, Miss Thomson, Clatto, Cupar, Fife, "Delphinium" (7937).

Best Hunter Filly, entered in Classes 68, 69, *and* 70, *registered with a number in the Hunter Stud-Book, or the entry tendered within one month of the award*—Champion Gold Medal, value £5. Given by the Hunters' Improvement and National Light Horse Breeding Society.

No. 568 Steel, Captain J., Kirkwood, Lockerbie, "Stampede" (8817).

Reserve—No. 557 Duguid, Miss H. M., Manar, Inverurie, Aberdeenshire, "Belinda II."

CLASS 68. YELD MARE, FILLY, or GELDING, born in 1934—*in hand.*—PREMIUMS, £10, £5, and £3.

1st No. 553 Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, Gelding, "Gingerbread II." (1896).
2nd No. 551 Aiton, R. Scott, Legerwood, Earlston, Berwickshire, Filly, "Twinkler."
3rd No. 554 Spencer-Nairn, Major Sir Robert, Bt., Leslie House, Leslie, Fife, Gelding, "'Ard to Please."

CLASS 69. YELD MARE, FILLY, or GELDING, born in 1935—*in hand*.—PREMIUMS, £10, £5, and £3.

1st	No. 555	Buchanan-Jardine, Sir John William, of Castle Milk, Bt., Castle Milk, Lockerbie, Gelding, "Red Hot" (2119).
2nd	No. 557	Duguid, Miss H. M., Manar, Inverurie, Aberdeenshire, Filly, "Belinda II."
3rd	No. 558	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder, Gelding, "Rosini."
V	No. 561	Thomson, A. D., of Nenthorn, Kelso, Gelding.
H	No. 556	Connor, E. C., Whitelee, St Boswells, Gelding, "John Peel."
C	No. 560	Steel, Captain J., Kirkwood, Lockerbie, Filly, "Streamline" (8488).

CLASS 70. FILLY, COLT, or GELDING, born in 1936—*in hand*.—PREMIUMS, £10, £5, and £3.

1st	No. 562	Currie, Miss Thomson, Clatto, Cupar, Fife, Gelding, "Television."
2nd	No. 564	Parsons, Mrs E. H. T., Fordbank, Milliken Park, Renfrewshire, Colt, "Brian Gay."
3rd	No. 567	Sanderson, J. Martin, Linthill, Melrose, Colt, "Linthill."
V	No. 568	Steel, Captain J., Kirkwood, Lockerbie, Filly, "Stampede" (8817).
H	No. 566	Parsons, Mrs E. H. T., Fordbank, Milliken Park, Renfrewshire, Colt, "Brian Rock."
C	No. 563	Kennard, Captain H. J., The Haining, Polmont, Stirlingshire, Colt, "Jason."
C	No. 565	Parsons, Mrs E. H. T., Fordbank, Milliken Park, Renfrewshire, Filly, "Brian Rose."

CLASS 71. MARE or GELDING, born before 1933, to carry 14 stone and over—*in saddle*.—PREMIUMS, £15, £10, and £5.

1st	No. 571	Macharg, Miss M. E., Carisbrooke, Helensburgh, Gelding, "Shah Jahan" (1933).
2nd	No. 569	Cross, Donald, Knockdon, Maybole, Gelding, "Far Away."
3rd	No. 572	Paton, Arthur, Whitehill, St Boswells, Gelding, "Valentine."
V	No. 574	Tullis, George, George Hotel Stables, Kirkcaldy, Gelding, "Rookery Nook."
H	No. 573	Sanderson, J. Martin, Linthill, Melrose, Mare, "Merry" (7987).

CLASS 72. MARE or GELDING, born before 1933, to carry under 14 stone—*in saddle*.—PREMIUMS, £15, £10, and £5.

1st	No. 584	Paton, Arthur, Whitehill, St Boswells, Gelding, "Bluebeard."
2nd	No. 576	Brown, H. Stuart, Cathlaw, Bathgate, Gelding, "Young Lochinvar" (2079).
3rd	No. 575	Aiton, R. Scott, Legerwood, Earlston, Berwickshire, Gelding, "Dictator."
V	No. 585	Patrick, Cargill L., Station Stables, Cupar, Fife, Gelding, "Glider."
H	No. 588	Sharpe, Major R. W., of The Park, Earlston, Berwickshire, Gelding, "Royal Oak."
C	No. 580	Hutchison, Miss Joan, Largo House, Upper Largo, Fife, Gelding, "Dog Rose."
C	No. 583	Nicol, Major R. P., Newfield, Ecclefechan, Dumfriesshire, Gelding, "Artine."

CLASS 73. MARE or GELDING, born in 1933—*in saddle.*—PREMIUMS, £15, £10, and £5.

1st	No. 599	Thomson, A. D., of Nenthorn, Kelso, Gelding, " Forefront."
2nd	No. 595	Hamilton, Mrs M. E., Abbey Hotel, Melrose, Mare, " Old Dromore " (8662).
3rd	No. 600	Thomson, A. D., of Nenthorn, Kelso, Mare, " Penny Wise " (8663).
V	No. 601	Young, James L., 4 Gordon Street, Paisley, Gelding, " Knocklayde."
H	No. 597	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder, Gelding, " Rosalion " (1953).
C	No. 598	Steel, Captain J., Kirkwood, Lockerbie, Mare, " Speedway " (8203).

CLASS 74. HACK of HUNTER TYPE, born in or before 1933, not exceeding 15.2 hands—*in saddle.*—PREMIUMS, £8, £5, and £3.

1st	No. 603	Parsons, Mrs E. H. T., Fordbank, Milliken Park, Renfrewshire, Mare, " Rosarch " (7689).
2nd	No. 607	Thomson, A. D., of Nenthorn, Kelso, Mare, " Ripple."
3rd	No. 605	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder, Mare, " Black Susan."
V	No. 604	Rennie, Miss Jen, Glenview, Paisley, Gelding, " Danillo."
H	No. 608	Woodger, Jack, Golfhall, Corstorphine, Edinburgh, Mare, " Shot Silk."
C	No. 602	Aldridge, Miss Angela, 5 Clarendon Crescent, Edinburgh, Gelding, " Cherry Brandy."

RIDING PONIES.

CLASS 75. MARE or GELDING, any age, over 13.2 hands, and not exceeding 14.2 hands—*in saddle.*—PREMIUMS, £5, £3, and £2.

1st	No. 615	Patterson, David, & Son, Church Street, Johnstone, Gelding, " Johnnie."
2nd	No. 609	Buchan, Miss M. S. F., Newseat of Manar, Inverurie, Aberdeenshire, Mare, " Radiance."
3rd	No. 616	Stein, Colonel Alan, Millfield, Polmont, Stirlingshire, Mare, " Sonnet."
V	No. 614	Henderson, Ian D., 24 Park Road, Paisley, Mare, " Bitter Sweet."
H	No. 612	Campbell, Hon. Jean, Hunthill, Jedburgh, Gelding, " Barrier."
C	No. 613	Forrest, Master William, Horsville, 24 Blane Street, Glasgow, Gelding, " Snowdrop."

CLASS 76. MARE or GELDING, any age, over 12 hands, and not exceeding 13.2 hands—*in saddle*—to be ridden by boy or girl not exceeding 14 years of age.—PREMIUMS, £5, £3, and £2.

1st	No. 618	Henderson, Ian D., 24 Park Road, Paisley, Mare, "Rose Marie."
2nd	No. 617	Boyd, Miss Jean, Edgefield, Loanhead, Midlothian, Mare, "Melka."
3rd	No. 619	Buchan, Miss M. S. F., Newseat of Manar, Inverurie, Aberdeenshire, Gelding, "Peter Gay."

CLASS 77. MARE or GELDING, any age, not exceeding 12 hands—*in saddle*—to be ridden by boy or girl not exceeding 12 years of age.—PREMIUMS, £5, £3, and £2.

1st	No. 622	Glen-Coats, Misses E. and L., Fordbank, Milliken Park, Renfrewshire, Mare, "Wild Rose" (8701).
2nd	No. 623	Thomson, Master Davie, Lambden, Greenlaw, Berwickshire, Mare, "Tiddleywinks."
3rd	No. 624	Thomson, Miss Jean, Lambden, Greenlaw, Berwickshire, Gelding, "Broncho."
V	No. 625	Wilkinson, Miss Anne, Whitehaugh, Hawick, Gelding, "Loden."
H	No. 620	Dalziel, Master Bobs, Crookston Old House, Heriot, Midlothian, Gelding, "Billy."
C	No. 621	Duguid, Miss H. M. Manar, Inverurie, Aberdeenshire, Mare, "Starlight."

HIGHLAND AND WESTERN ISLAND PONIES.

PRESIDENT'S CHAMPION MEDAL for best Highland or Western Island Pony.

No. 652 Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, "Moldagh" (5939).

Reserve—No. 653 Cameron, Mrs J. A., Glenfinlas, Callander, "Barra Ledi" (6958).

Kinmonth Perpetual Gold Challenge Quaich *for best Highland or Western Island Pony*. This Quaich—along with a sum of money to provide a miniature replica in silver annually—was presented by Mrs Moncrieff Wright, Kinmonth, Bridge of Earn, in memory of her husband, the late John Moncrieff Wright of Kinmonth.

No. 652 Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, "Moldagh" (5939).

Dundee Citizens' Perpetual Silver Challenge Cup, value about £50, *for the best Highland or Western Island Pony, "Extra Stock" eligible to compete*. This Cup was presented by the Citizens of Dundee to commemorate the holding of the Society's Annual Show at Dundee in 1933.

No. 652 Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, "Moldagh" (5939).

Special Prize of £8 given by Highland Pony Society *for best Male Animal not exceeding 14.2 hands, entered in Classes 78 and 79. "Extra Stock" not eligible to compete. Competition to be strictly confined to animals passed sound and free from hereditary disease.*

No. 628 Wooley, Thomas, Caledonian Hotel, Bonar Bridge, Sutherland, "Loch Maddy" (1973).

CLASS 78. STALLION, born before 1935, not exceeding 14.2 hands. —PREMIUMS, £8, £5, £3, and £2.

1st No. 628 Wooley, Thomas, Caledonian Hotel, Bonar Bridge, Sutherland, "Loch Maddy" (1973).
2nd No. 629 Wright, Major D. G. Moncrieff, Elcho Park, Rhynd, Perth, "Banvie Laddie" (1901).
3rd No. 627 Walker, William, of Foreland, Bruichladdich, Isle of Islay, "Boy David" (2036).
4th No. 626 Sharp, Miss E. C., Balmuir, Dundee, "Alt-an-Buidhe of Dalnaglar" (1943).

EXTRA STOCK.

The following received an award of £5 :—

No. 630 Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "Glen Boltichan" (1749).

CLASS 79. ENTIRE COLT, born on or after 1st January 1935, not exceeding 14 2 hands.—PREMIUMS, £8, £5, £3, and £2.

1st No. 635 Purdie, Thomas, Aucheneck, Killearn, Stirlingshire, "Benmore" (2042).
2nd No. 636 Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, "Blair Essan" (2102).
3rd No. 633 Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "Glen Lednock" (2054).
4th No. 631 Cairns, James, West Biggs, Blackford, Perthshire, "Hamish."
V No. 632 Honeyman, Mrs R. Wemyss, Derculich, Strathtay, Perthshire, "Jim of Derculich."
H No. 637 Wright, Major D. G. Moncrieff, Elcho Park, Rhynd, Perth, "Kinmonth Laddie" (1979).
C No. 634 Mackelvie, Donald, New Lanark, Lamlash, Isle of Arran, "Douglas" (2056).

Special Prize of £8 given by Highland Pony Society *for best Female Animal not exceeding 14.2 hands, entered in Classes 80 to 82. "Extra Stock" not eligible to compete. Competition to be strictly confined to animals passed sound and free from hereditary disease.*

No. 653 Cameron, Mrs J. A., Glenfinlas, Callander, "Barra Ledi" (6958).

CLASS 80. MARE, any age, not exceeding 14.2 hands, with Foal at foot, or due to foal before 31st July 1937.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 641	Purdie, Thomas, Aucheneck, Killearn, Stirlingshire, " Monamore " (5515).
2nd	No. 640	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, " Calliach Bhan VIII." (5938).
3rd	No. 642	Walker, William, of Foreland, Bruichladdich, Isle of Islay, " Mona VII." (6994).
4th	No. 643	Wright, Major D. G. Moncrieff, Elcho Park, Rhynd, Perth, " Fiona III." (6472).
V	No. 638	Blair, Mrs A. J., Beananach, Strathyre, Perthshire, " Kirsty of Beananach."
H	No. 639	Honeyman, Mrs R. Wemyss, Derculich, Strathtay, Perthshire, " Peggie "

CLASS 81. YELD MARE or FILLY, born before 1935, not exceeding 14.2 hands.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 644	Campbell, Colin, Shiel House, Glenshiel, Ross-shire, Mare, " Faillie Wren " (5357).
2nd	No. 645	Campbell, Colin, Shiel House, Glenshiel, Ross-shire, Mare, " Pride of Strathaird " (7030).
3rd	No. 650	Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, Filly, " Shelagh " (6816).
4th	No. 651	Wright, Major D. G. Moncrieff, Elcho Park, Rhynd, Perth, Mare, " Nancy of Kinmonth " (6107).
V	No. 647	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, Filly, " Grey Lady of Dunira " (6663).
H	No. 646	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, Filly, " Queen Charming of Dunira " (6664).
C	No. 649	Mackelvie, Donald, New Lanark, Lamlash, Isle of Arran, Filly, " Mairi Ruadh " (7033).

EXTRA STOCK.

The following received an award of £5 :—

No. 652	Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, Mare, " Moldagh " (5939).

CLASS 82. FILLY, born on or after 1st January 1935, not exceeding 14.2 hands.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 653	Cameron, Mrs J. A., Glenfinlas, Callander, " Barra Ledi " (6958).
2nd	No. 654	Cameron, Mrs J. A., Glenfinlas, Callander, " Borve Ledi " (6959).
3rd	No. 658	Purdie, Thomas, Aucheneck, Killearn, Stirlingshire, " Flora VII." (7018).
4th	No. 659	Wilson, T. G., Carbeth Home Farm, Balfron Station, Stirlingshire, " Sanna " (7043).
V	No. 660	Wright, Major D. G. Moncrieff, Elcho Park, Rhynd, Perth, " Janet of Kinmonth " (6830).
H	No. 657	Mackelvie, Donald, New Lanark, Lamlash, Isle of Arran, " Lorna V." (7034).

SHETLAND PONIES.

(ALL SHOWN IN HAND)

PRESIDENT'S CHAMPION MEDAL
for best Shetland Pony.

No. 675 Kerr, J. E , of Harviestoun, Dollar, " Harviestoun Pixie."

Reserve—No 666 Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, " Birk of Manar " (1301).

Perpetual Silver Challenge Cup, value £50, *for best Group of Shetland Ponies drawn from the ordinary Classes, consisting of one male and two females. " Extra Stock " eligible to compete.* Presented by a few members of the Shetland Pony Stud-Book Society.

Nos. 669, 675, 687 Kerr, J. E., of Harviestoun, Dollar.

Silver Medal *for the best Shetland Pony of the sex opposite to that of the winner of the President's Medal, entered or eligible for entry in the Shetland Pony Stud-Book.* Given by the Shetland Pony Stud-Book Society.

No. 666 Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, " Birk of Manar " (1301).

CLASS 83. STALLION, not exceeding 10½ hands, born before 1934. —PREMIUMS, £8, £5, £3, and £2.

1st No. 663 Dick, Mrs E. M., of Transy, Dunfermline, " Benjamin " (1299).
2nd No. 664 Dick, Mrs E. M., of Transy, Dunfermline, " Major of Earlshall " (1316).
3rd No. 665 Kerr, J. E., of Harviestoun, Dollar, " Rosador of Transy " (1267).
4th No. 662 Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, " Elector of Sansaw " (1306).
V No. 661 Butter, Misses J. and M., Cluniemore, Pitlochry, " Balmohr Nick " (1345).

EXTRA STOCK.

The following received an award of £5 :—

No. 666 Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, " Birk of Manar " (1301).

CLASS 84. ENTIRE COLT, not exceeding 10½ hands, born in 1934 or 1935.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 669	Kerr, J. E., of Harviestoun, Dollar, "Benito" (late Berlnor of Transy).
2nd	No. 668	Dick, Mrs E. M., of Transy, Dunfermline, "Bergastor of Transy."
3rd	No. 667	Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, "Hackon of Newmore."
4th	No. 671	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "Enfield of Dunira."
V	No. 670	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "Porthus of Dunira."

CLASS 85. MARE, not exceeding 10½ hands, with Foal at foot, or due to foal before 31st July 1937.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 675	Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Pixie."
2nd	No. 674	Dick, Mrs E. M., of Transy, Dunfermline, "Stelmone of Transy."
3rd	No. 672	Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, "Golden Wing of Maryfield" (4631).
4th	No. 677	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "May of Earlshall" (4605).
V	No. 678	Ritchie, Miss A. R., Netherley House, Stonehaven, "Emita of Earlshall" (4073).

CLASS 86. YELD MARE, not exceeding 10½ hands—PREMIUMS, £8, £5, £3, and £2.

1st	No. 679	Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, "Mermaid of Mundurno" (787) (I.S.).
2nd	No. 680	Dick, Mrs E. M., of Transy, Dunfermline, "Sunray of Transy."
3rd	No. 682	Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Sheila" (4287).
4th	No. 684	Ritchie, Miss A. R., Netherley House, Stonehaven, "Precious of Netherley."
V	No. 683	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "May Morn of Earlshall" (4606).
H	No. 681	Dick, Mrs E. M., of Transy, Dunfermline, "Bergia of Transy" (4608).

CLASS 87. FILLY, not exceeding 10½ hands, born in 1934 or 1935.—PREMIUMS, £8, £5, £3, and £2.

1st	No. 686	Dick, Mrs E. M., of Transy, Dunfermline, "Satantia of Transy."
2nd	No. 687	Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Pat."
3rd	No. 688	Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Truda."
4th	No. 685	Davidson, Alexander, Mundurno, Bridge of Don, Aberdeen, "Katherine of Mundurno."
V	No. 689	Macbeth, W. Gilchrist, of Dunira, Comrie, Perthshire, "Alice of Dunira."

HACKNEYS IN HARNESS.

PRESIDENT'S CHAMPION MEDAL
for best Animal in the Classes for Hackneys in Harness.

No. 698 Briggs, Mr and Mrs Walter, Linden Hall, Borwick, Carnforth, Lancs., Mare, "Barcroft Belle" (26,769).

Reserve—No 697 Hamilton, John M., Bogton, Muirend, Glasgow, Mare, "Riquette" (26,483).

CLASS 88. STALLION, MARE, FILLY, or GELDING, any age, in Harness, exceeding 14 hands, to be driven in the ring.—PREMIUMS, £15, £10, and £5.

1st No. 692 Kinross, William, 13 Clarendon Place, Stirling, Mare, "Nork Curlew" (26,964).
2nd No. 691 Hamilton, John M., Bogton, Muirend, Glasgow, Mare, "Bogton Betty" (27,257).
3rd No. 694 Sweeney, W. T., Aultnaskiach Dairy Farm, Inverness, Gelding, "Norwood Sensation."
V No. 693 M'Donald, George, Roedene, 4 Larch Road, Dumbreck, Glasgow, Gelding, "Spellbinder" (G 590).

EXTRA STOCK.

The following received an award of £5 :—

No. 697 Hamilton, John M., Bogton, Muirend, Glasgow, Mare, "Riquette" (26,483).

CLASS 89. STALLION, MARE, FILLY, or GELDING, any age, in Harness, 14 hands and under, to be driven in the ring.—PREMIUMS, £10, £5, and £3.

1st No. 698 Briggs, Mr and Mrs Walter, Linden Hall, Borwick, Carnforth, Lancs., Mare, "Barcroft Belle" (26,769).

DRAUGHT GELDINGS IN HARNESS.

CLASS 90. DRAUGHT GELDING, any age, in Harness, shown in Cart or Lorry (and driven by single driver), it being a condition that the Horse must have been regularly worked for a period of 12 weeks prior to the first day of the Show. PRIZE MONEY—£10, £5, £3, and £2.

(Cancelled—Insufficient Entries.)

JUMPING COMPETITIONS.

Champion Prize of £10 *for most points in Prizes with one Horse in Classes* 1, 3, *and* 5.

CONDITIONS.—First Prize to count five points; Second Prize, four points; Third Prize, three points; Fourth Prize, two points; Fifth Prize, one point. The money to be evenly divided in the event of a tie.

Foster, F. W., Fransy Farm, Etwall, Derby, Gelding, "Huntsman" (7½ points).

CLASS 1. HORSE or PONY, any height.—PREMIUMS, £20, £15, £10, £5, and £3.

1st, 2nd, 3rd, 4th equal
Taylor, Joseph, Moss Hall, Stretton, Warrington, Gelding, "Exchange."
Hall, Henry, Whitchester, Heddon, Newcastle-on-Tyne, Gelding, "Sparky."
Taylor, Joseph, Moss Hall, Stretton, Warrington, Gelding, "The Knut."
Alexander, W. F., Bridge Hill Farm, Blackhill, Co. Durham, Gelding, "Joe."

5th equal
Foster, F. W., Fransy Farm, Etwall, Derby, Gelding, "Huntsman."
Massarella, A., & Sons Ltd., Belmont, Bentley, Doncaster, Gelding, "Coronation."

CLASS 2. HORSE or PONY, any height, confined to competitors permanently resident in Scotland. The Horse or Pony to have been the property of the competitor since 1st May 1937.—PREMIUMS, £10, £8, £5, £3, and £2.

1st Blackwood, Patrick, Balgreen, Midcalder, Mare, "Kopje."
2nd Chambers, Miss Irene, The Hollies, Langside Drive, Newlands, Glasgow, Mare, "Anne Tucker."
3rd Brown, Miss M. C., Westerton, Killearn, Mare, "Silver Mist."
4th Robertson, A. D., Langton, Laurieston, Stirlingshire, Gelding, "Cockleroi."
5th Snodgrass, James, Kippielaw, Dalkeith, Gelding, "Buckle."

CLASS 3. HORSE or PONY, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the First Prize, and 4 inches for the winner of the Second Prize in Class 1.—PREMIUMS, £20, £15, £10, £5, and £3.

1st, 2nd, 3rd, 4th, 5th equal
Chambers, Miss Irene, The Hollies, Langside Drive, Newlands, Glasgow, Mare, "Anne Tucker."
Brown, Miss M. C., Westerton, Killearn, Mare, "Silver Mist."
Grange Brothers, Brook Manor, Alvaston, Nantwich, Gelding, "Desire."
Makin, Thomas, Newton Farm, Newton, Castleford, Gelding, "Crackle."
Foster, F. W., Fransy Farm, Etwall, Derby, Gelding, "Huntsman."

CLASS 4. HORSE or PONY, any height.—
PREMIUMS, £10, £8, £5, £3, and £2.

1st	Chambers, Miss Irene, The Hollies, Langside Drive, Newlands, Glasgow, Mare, " Anne Tucker."
2nd 3rd 4th 5th equal	Robertson, A. D., Langton, Laurieston, Stirlingshire, Gelding, " Cockleroi." Grange Brothers, Brook Manor, Alvaston, Nantwich, Gelding, " Desire." Makin, Thomas, Newton Farm, Newton, Castleford, Gelding, " Crackle." Makin, Thomas, Newton Farm, Newton, Castleford, Gelding, " Tony." Mitchell, Harold P., Tulliallan Castle, Kincardine, Gelding, " Dublin."

CLASS 5. HORSE or PONY, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the First Prize, and 4 inches for the winner of the Second Prize in either of Classes 1 or 3—4 inches extra for the winner of the two First Prizes in Classes 1 and 3.—
PREMIUMS, £15, £10, £5, £3, and £2.

1st 2nd equal	Foster, F. W., Fransy Farm, Etwall, Derby, Gelding, " Huntsman." Grange Brothers, Brook Manor, Alvaston, Nantwich, Gelding, " Found."
3rd 4th 5th equal	Hall, Henry, Whitchester, Heddon, Newcastle-on-Tyne, Gelding, " Gay Boy." Snodgrass, James, Kippielaw, Dalkeith, Gelding, " Buckle." Makin, Thomas, Newton Farm, Newton, Castleford, Gelding, " Tony." Taylor, Joseph, Moss Hall, Stretton, Warrington, Mare, " Bon Bon." Taylor, Joseph, Moss Hall, Stretton, Warrington, Gelding, " Exchange."

SHEEP

BLACKFACE.

PRESIDENT'S CHAMPION MEDAL *for best Blackface Sheep.*

No. 708 Hamilton, Matthew G., Woolfords, Cobbinshaw.

Reserve—No. 703 Anderson, W. W., Colzium, Kirknewton, Midlothian, "Old School."

Paisley Perpetual Gold Challenge Cup, value £300, *for best Blackface Sheep, "Extra Stock" eligible to compete.* This Cup, along with an endowment of £600, was provided from money collected in Paisley by the late Provost Muir M'Kean, and is in commemoration of the Society's first Show at Paisley in 1913.

No. 708 Hamilton, Matthew G., Woolfords, Cobbinshaw.

Reserve—No. 703 Anderson, W. W., Colzium, Kirknewton, Midlothian, "Old School."

The "Lochlane" Silver Challenge Cup, value £50, *for best Group of three Blackface Sheep, consisting of Ewe, Gimmer, and Ewe Lamb, drawn from Classes* 91 *to* 97, *"Extra Stock" eligible to compete.* Presented by Mr and Mrs Francis A. Rottenburg, Lochlane, Crieff.

Nos. 817, 832, 851 Macfarlane, James, Steps of Cally, Blairgowrie.

The "James Archibald" Prize, of about £20, *for the best Sheep in the Blackface Classes (excluding Lambs), "Extra Stock" eligible to compete.* This Prize consists of the annual free income from a fund of £600, gifted by the late David Archibald, Christchurch, New Zealand, to found a Prize to be offered at the Annual Shows of the Society in commemoration of his brother, the late James Archibald, Overshiels, Stow.

No. 708 Hamilton, Matthew G., Woolfords, Cobbinshaw.

CLASS 91. TUP, three Shear and over.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 708	Hamilton, Matthew G., Woolfords, Cobbinshaw.
2nd	No. 703	Anderson, W. W., Colzium, Kirknewton, Midlothian, "Old School."
3rd	No. 713	M'Laren, James, Shielbrae, Cambusbarron.
4th	No. 714	Mitchell, William, Hazelside, Douglas, Lanark, "Copyright."
V	No. 719	Rosebery, The Earl of, D.S.O., M.C. (Rosebery Estates), Moorfoot Farm, Gorebridge, "Keen Blade."
H	No. 709	Hamilton, Matthew G., Woolfords, Cobbinshaw.
C	No. 711	Macfarlane, James, Steps of Cally, Blairgowrie, "Weston Statesman."
C	No. 716	Provan, A. & D., Gateside, Douglas, Lanark, "Adoption."

CLASS 92. TUP, two Shear.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 737	Rennie, H. Wylie, Craighat, Dumgoyne Station, Stirlingshire, "Foundation."
2nd	No. 723	Cairns, John M. M., Dalchruin, Glenartney, Comrie.
3rd	No. 730	M'Laren, James, Shielbrae, Cambusbarron.
4th	No. 731	Mitchell, William, Hazelside, Douglas, Lanark.
V	No. 735	Provan, A. & D., Gateside, Douglas, Lanark, "Television."
H	No. 726	Hamilton, Matthew G., Woolfords, Cobbinshaw.
C	No. 724	Cayley, Arthur, of Carham Hall, Coldstream, "Celebrate."
C	No. 729	Macfarlane, James, Steps of Cally, Blairgowrie, "One Step."
C	No. 734	Paton, Robert C., Lettre, Killearn, "Duntreath Castle."

CLASS 93. SHEARLING TUP.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 758	Hamilton, Matthew G., Woolfords, Cobbinshaw.
2nd	No. 757	Forbes, John, Severie, Doune.
3rd	No. 761	Hamilton, Matthew G., Woolfords, Cobbinshaw.
4th	No. 765	Macdonald, James A., Urlar, Aberfeldy, "Corner Stone."
V	No. 774	Mitchell, William, Hazelside, Douglas, Lanark.
H	No. 767	Macfarlane, James, Steps of Cally, Blairgowrie, "Time o' Day."
C	No. 745	Cayley, Arthur, of Carham Hall, Coldstream.
C	No. 772	Mitchell, William, Hazelside, Douglas, Lanark.
C	No. 778	Provan, A. & D., Gateside, Douglas, Lanark.
C	No. 782	Rosebery, The Earl of, D.S.O., M.C. (Rosebery Estates), Moorfoot Farm, Gorebridge, "Grenadier."

CLASS 94. TUP LAMB.—PREMIUMS, £5, £3, and £2.

1st	No. 794	Macfarlane, James, Steps of Cally, Blairgowrie.
2nd	No. 786	Cayley, Arthur, of Carham Hall, Coldstream.
3rd	No. 796	Marshall & Mitchell, Bleaton, Blairgowrie.
V	No. 797	Marshall & Mitchell, Bleaton, Blairgowrie.
H	No. 785	Black, J. Belfrage, Holton, Milnathort.
C	No. 802	Rosebery, The Earl of, D.S.O., M.C. (Rosebery Estates), Moorfoot Farm, Gorebridge.
C	No. 804	Rottenburg, F. A., of Lochlane, Crieff.

CLASS 95. EWE, above one shear (born before 1936), with Lamb at foot.—PREMIUMS, £10, £5, £3, and £2.

1st	No. 817	Macfarlane, James, Steps of Cally, Blairgowrie.
2nd	No. 816	Macfarlane, James, Steps of Cally, Blairgowrie, "Helen Fair."
3rd	No. 813	Cayley, Arthur, of Carham Hall, Coldstream, "Rachel."
4th	No. 820	Struthers, G. & R., South Halls, Strathaven.
V	No. 812	Cayley, Arthur, of Carham Hall, Coldstream, "Rosamund."
H	No. 821	Struthers, G. & R., South Halls, Strathaven.
C	No. 810	Black, J. Belfrage, Holton, Milnathort.

CLASS 96. SHEARLING EWE or GIMMER (born in 1936).—PREMIUMS, £10, £5, £3, and £2.

1st	No. 832	Macfarlane, James, Steps of Cally, Blairgowrie.
2nd	No. 825	Black, J. Belfrage, Holton, Milnathort.
3rd	No. 838	Stewart, John, Airtnock, Fenwick, " Irene."
4th	No. 829	Cayley, Arthur, of Carham Hall, Coldstream.
V	No. 839	Stewart, John, Airtnock, Fenwick, " Gala Lass."
H	No. 841	Struthers, G. & R., South Halls, Strathaven.
C	No. 828	Cayley, Arthur, of Carham Hall, Coldstream.

CLASS 97. EWE LAMB.—PREMIUMS, £5, £3, and £2.

1st	No. 844	Cayley, Arthur, of Carham Hall, Coldstream.
2nd	No. 851	Macfarlane, James, Steps of Cally, Blairgowrie.
3rd	No. 850	Lindsay, G. D. & W., Blackbyres, Kilmarnock.
V	No. 849	Lindsay, G. D. & W., Blackbyres, Kilmarnock.
H	No. 843	Black, J. Belfrage, Holton, Milnathort.
C	No. 855	Rottenburg, F. A., of Lochlane, Crieff.

CHEVIOT.

PRESIDENT'S CHAMPION MEDAL for best Cheviot Sheep.

No. 861 Elliot, Arthur, Hindhope, Jedburgh.

Reserve—No. 878 Elliot, John, Blackhaugh, Clovenfords.

Borthwick Perpetual Challenge Cup, value £25, gifted by Mr J. Borthwick, *for best Sheep in the Cheviot Classes, " Extra Stock " eligible to compete.* Given by the Cheviot Sheep Society.

No. 861 Elliot, Arthur, Hindhope, Jedburgh.

CLASS 98. TUP, above one Shear.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 861	Elliot, Arthur, Hindhope, Jedburgh.
2nd	No. 863	Elliot, John, Blackhaugh, Clovenfords, " Millknowe."
3rd	No. 864	Hogg, George, Penmanshiel, Grantshouse, " Border Surprise."
4th	No. 862	Elliot, Arthur, Hindhope, Jedburgh.

CLASS 99. SHEARLING TUP.—PREMIUMS, £12, £8, £4, and £2.

1st	No. 868	Elliot, Arthur, Hindhope, Jedburgh.
2nd	No. 870	Elliot, John, Blackhaugh, Clovenfords.
3rd	No. 869	Elliot, Arthur, Hindhope, Jedburgh.
4th	No. 871	Elliot, John, Blackhaugh, Clovenfords.
V	No. 873	Hogg, George, Penmanshiel, Grantshouse.
H	No. 872	Hogg, George, Penmanshiel, Grantshouse, " Coronation."

CLASS 100. TUP LAMB.—PREMIUMS, £5, £3, and £2.

1st	No. 878	Elliot, John, Blackhaugh, Clovenfords.
2nd	No. 879	Elliot, John, Blackhaugh, Clovenfords.
3rd	No. 877	Elliot, Arthur, Hindhope, Jedburgh.
V	No. 876	Elliot, Arthur, Hindhope, Jedburgh.
H	No. 880	Hogg, George, Penmanshiel, Grantshouse

CLASS 101. EWE, above one Shear, with Lamb at foot.—Premiums, £10, £5, £3, and £2.

1st No. 884 Elliot, Arthur, Hindhope, Jedburgh.
2nd No. 886 Elliot, John, Blackhaugh, Clovenfords.
3rd No. 887 Hogg, George, Penmanshiel, Grantshouse.

CLASS 102. SHEARLING EWE or GIMMER.—Premiums, £10, £5, £3, and £2.

1st No. 894 Hogg, George, Penmanshiel, Grantshouse.
2nd No. 891 Elliot, Arthur, Hindhope, Jedburgh.
3rd No. 892 Elliot, John, Blackhaugh, Clovenfords.
4th No. 893 Elliot, John, Blackhaugh, Clovenfords.

CLASS 103. EWE LAMB.—Premiums, £5, £3, and £2.

1st No. 900 Elliot, John, Blackhaugh, Clovenfords.
2nd No. 898 Elliot, Arthur, Hindhope, Jedburgh.
3rd No. 899 Elliot, John, Blackhaugh, Clovenfords.

BORDER LEICESTER.

PRESIDENT'S CHAMPION MEDAL for best Border Leicester Sheep.

No. 902 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, " Sandyknowe Coronation " (11,308).

Reserve—No. 919 Howie, James, & Sons, Muirside, Dumfries, " Border Select " (11,044).

Gold Medal *for best Male Animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock Book. Animals entered as " Extra Stock " not eligible.* Given by the Society of Border Leicester Sheep Breeders.

No. 902 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, " Sandyknowe Coronation " (11,308).

CLASS 104. TUP, above one Shear.—Premiums, £12, £8, £4, and £2.

1st No. 902 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, " Sandyknowe Coronation " (11,308).
2nd No. 906 Murray, R. G., & Son, Spittal, Biggar, " Bold Bogardo " (10,624).
3rd No. 907 Young, J. & W., Skerrington Mains, Hurlford.
4th No. 904 Kinnaird, John, Papple, Haddington.

CLASS 105. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

1st No. 919 Howie, James, & Sons, Muirside, Dumfries, " Border Select " (11,044).
2nd No. 923 Mansfield Estates, Balboughty, Perth.
3rd No. 911 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, (BL 46 B) M 3.
4th No. 908 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
V No. 910 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, (BL 964) M 5.
H No. 926 Murray, R. G., & Son, Spittal, Biggar, " Summer Sun " (11,333).
C No. 909 Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, (BL 878) M 15.

CLASS 106. TUP LAMB.—PREMIUMS, £10, £5, £3, and £2.

1st	No. 952	Young, J. & W., Skerrington Mains, Hurlford.
2nd	No. 943	Howie, James, & Sons, Muirside, Dumfries.
3rd	No. 944	Howie, James, & Sons, Muirside, Dumfries.
4th	No. 945	Howie, James, & Sons, Muirside, Dumfries.
V	No. 933	Brown, Alexander, Smailholm, Kelso.
H	No. 932	Barr, Allan, Hobsland, Monkton.
C	No. 928	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
C	No. 931	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
C	No. 935	Cameron, R. C., Greenlawdean, Berwickshire.

Gold Medal *for best Female Animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock Book. Animals entered as "Extra Stock" not eligible.* Given by the Society of Border Leicester Sheep Breeders.

No. 974 Mansfield Estates, Balboughty, Perth.

CLASS 107. EWE, above one Shear.—PREMIUMS, £10, £5, £3, and £2.

1st	No. 954	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch, (BL 42 A) L 5.
2nd	No. 962	Murray, R. G., & Son, Spittal, Biggar.
3rd	No. 959	Mansfield Estates, Balboughty, Perth.
4th	No. 955	Barr, Allan, Hobsland, Monkton, (BL 372) L 1.
V	No. 953	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
H	No. 964	Young, J. & W., Skerrington Mains, Hurlford.
C	No. 963	Piper, James, of The Grange, Burntisland, (BL 89 C) J 2.

CLASS 108. SHEARLING EWE or GIMMER.—PREMIUMS, £10, £5, £3, and £2.

1st	No. 974	Mansfield Estates, Balboughty, Perth.
2nd	No. 965	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
3rd	No. 966	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
4th	No. 968	Brown, Alexander, Smailholm, Kelso.
V	No. 979	Murray, R. G., & Son, Spittal, Biggar.
H	No. 978	Murray, R. G., & Son, Spittal, Biggar.
C	No. 967	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.

CLASS 109. EWE LAMB.—PREMIUMS, £5, £3, and £2.

1st	No. 992	Howie, James, & Sons, Muirside, Dumfries.
2nd	No. 995	Murray, R. G., & Son, Spittal, Biggar.
3rd	No. 987	Barr, Allan, Hobsland, Monkton.
V	No. 996	Piper, James, of The Grange, Burntisland.
H	No. 988	Cameron, R. C., Greenlawdean, Berwickshire.
C	No. 984	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.
C	No. 986	Balfour, Colonel E. W. S., D.S.O., O.B.E., M.C., of Balbirnie, Markinch.

HALF-BRED.

PRESIDENT'S CHAMPION MEDAL for best Half-Bred Sheep.

No 999 Elliot, John, Blackhaugh, Clovenfords.
Reserve—No. 1004 Brown, Alexander, Smailholm, Kelso.

CLASS 110. SHEARLING TUP.—Premiums, £10, £7, and £3.

1st	No. 999	Elliot, John, Blackhaugh, Clovenfords.
2nd	No. 998	Elliot, John, Blackhaugh, Clovenfords.

CLASS 111. EWE, above one Shear.—Premiums, £10, £5, and £2

1st	No. 1002	Templeton, T. & M., Sandyknowe, Kelso.

CLASS 112. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

1st	No. 1004	Brown, Alexander, Smailholm, Kelso.

CLASS 113. EWE LAMB.—Premiums, £5, £3, and £2.

1st	No. 1009	M'Laren, William, Fairnington, Roxburgh.
2nd	No. 1008	M'Laren, William, Fairnington, Roxburgh.

OXFORD DOWN.

PRESIDENT'S CHAMPION MEDAL for best Oxford Down Sheep.

No. 1017 Kinnaird, John, Papple, Haddington.
Reserve—No. 1038 Lawson, William H., Frithfield, Anstruther.

CLASS 114. SHEARLING TUP.—Premiums, £8, £5, and £3.

1st	No. 1017	Kinnaird, John, Papple, Haddington.
2nd	No. 1020	Templeton, T. & M., Sandyknowe, Kelso.
3rd	No. 1014	Clarkson, Alexander, Skirling Mill, Biggar.
V	No. 1018	Templeton, T. & M., Sandyknowe, Kelso.
H	No. 1015	Kinnaird, John, Papple, Haddington.
C	No. 1011	Bell, John, Balbuthie, Kilconquhar.
C	No. 1019	Templeton, T. & M., Sandyknowe, Kelso.

CLASS 115. SHEARLING EWE or GIMMER.—Premiums, £8, £5, and £3.

1st	No. 1026	Templeton, T. & M., Sandyknowe, Kelso.
2nd	No. 1024	Lawson, William H., Frithfield, Anstruther.
3rd	No. 1022	Bell, John, Balbuthie, Kilconquhar.
V	No. 1027	Templeton, T. & M., Sandyknowe, Kelso.
H	No. 1023	Lawson, William H., Frithfield, Anstruther.
C	No. 1021	Bell, John, Balbuthie, Kilconquhar.
C	No. 1025	Templeton, T. & M., Sandyknowe, Kelso.

CLASS 116. TUP LAMB.—PREMIUMS, £8, £5, and £3.

1st	No. 1034	Templeton, T. & M., Sandyknowe, Kelso.
2nd	No. 1030	Lawson, William H., Frithfield, Anstruther.
3rd	No. 1032	Templeton, T. & M., Sandyknowe, Kelso.
V	No. 1033	Templeton, T. & M., Sandyknowe, Kelso.
H	No. 1028	Bell, John, Balbuthie, Kilconquhar.
C	No. 1031	Lawson, William H., Frithfield, Anstruther.

CLASS 117. EWE LAMB.—PREMIUMS, £5, £3, and £2.

1st	No. 1038	Lawson, William H., Frithfield, Anstruther.
2nd	No. 1041	Templeton, T. & M., Sandyknowe, Kelso.
3rd	No. 1037	Lawson, William H., Frithfield, Anstruther.
V	No. 1036	Bell, John, Balbuthie, Kilconquhar.
H	No. 1040	Templeton, T. & M., Sandyknowe, Kelso.
C	No. 1035	Bell, John, Balbuthie, Kilconquhar.
C	No. 1039	Templeton, T. & M., Sandyknowe, Kelso.

SUFFOLK.

PRESIDENT'S CHAMPION MEDAL
for best Suffolk Sheep.

No. 1096 Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.

Reserve—No. 1045 Prince-Smith, Sir Prince, Bt., Southburn, Driffield, East Yorks.

Silver Challenge Cup, value £15, offered by the Suffolk Sheep Society *for best Group of Suffolk Sheep, consisting of one Tup, one shear and over, one Shearling Ewe or Gimmer, one Tup Lamb, and one Ewe Lamb—the Females and Tup Lamb must be bred by Exhibitor—drawn from Classes* 118 *to* 121. Given by the Suffolk Sheep Society.

No. 1048, 1062, 1077, 1096 Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.

CLASS 118. TUP, one Shear and over.—PREMIUMS, £10, £7, and £3.

1st	No. 1045	Prince-Smith, Sir Prince, Bt., Southburn, Driffield, East Yorks.
2nd	No. 1044	Prince-Smith, Sir Prince, Bt., Southburn, Driffield, East Yorks.
3rd	No. 1048	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
V	No. 1043	Duncan, Commander J. A., C.B., Parkhill, Arbroath.
H	No. 1049	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.

CLASS 119. SHEARLING EWE or GIMMER.—PREMIUMS, £10, £5, and £2.

1st	No. 1054	Golightly, William, Whitelaw, Haddington.
2nd	No. 1056	Prince-Smith, Sir Prince, Bt., Southburn, Driffield, East Yorks.
3rd	No. 1062	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
V	No. 1061	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
H	No. 1053	Duncan, Commander J. A., C.B., Parkhill, Arbroath.
C	No. 1052	Duncan, Commander J. A., C.B., Parkhill, Arbroath.
C	No. 1055	Golightly, William, Whitelaw, Haddington.

CLASS 120. TUP LAMB.—PREMIUMS, £10, £5, and £2.

1st	No. 1067	Duncan, Commander J. A., C.B., Parkhill, Arbroath.
2nd	No. 1077	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
3rd	No. 1078	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
V	No. 1079	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
H	No. 1070	Golightly, William, Whitelaw, Haddington.
C	No. 1065	Blythe, Charles, & Sons, Barberfield, Haddington.
C	No. 1076	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.

CLASS 121. EWE LAMB.—PREMIUMS, £5, £3, and £2.

1st	No. 1096	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
2nd	No. 1094	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
3rd	No. 1097	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
V	No. 1095	Whitton, William G., Ltd., Ingliston Farm, Eassie, Angus.
H	No. 1084	Duncan, Commander J. A., C.B., Parkhill, Arbroath.
C	No. 1085	Duncan, Commander J. A., C.B., Parkhill, Arbroath.
C	No. 1088	Golightly, William, Whitelaw, Haddington.

GOATS

PRESIDENT'S CHAMPION MEDAL
for best animal in the Goat Classes.

No. 1099 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Harpist" (BA 1101).

Reserve—No. 1104 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Middleton Myrtle" (S 287).

The Competition for Goats is recognised by the British Goat Society, Roydon Road, Diss, Norfolk, which will give Challenge Certificates (qualifying for a Championship) :—

For the best Female Goat over two years that has borne a kid—

No. 1099 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Harpist" (BA 1101).

For the best dual purpose Goat over two years that has borne a kid—

No. 1105 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Dissington Silvia" (S 261).

A Bronze Medal for the best female exhibit in Classes 122 *to* 127 *inclusive.*

No. 1099 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Harpist" (BA 1101).

Challenge Cup, value 20 Guineas, *for the best Female Goat in the Show.* Given by the late Lord Dewar, London—*to be competed for annually.*

No. 1099 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Harpist" (BA 1101).

CLASS 122. FEMALE GOAT, any age, in Milk, entered in or eligible for the Toggenburg Section or the British Toggenburg or British Alpine Section or Register of the Herd-Book.—PREMIUMS, £3, £2, and £1.

1st No. 1099 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Harpist" (BA 1101).
2nd No. 1103 Paisley, Mrs T. Leo, Parkhurst, Park Road, Harrogate, (British Toggenburg), "Kinneddar Crooner **Q**" (11,996).
3rd No. 1100 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Honesty" (BA 1102).
V No. 1102 Miller, Miss K. M. A., Lawmuir, Methven, Perth, (British Toggenburg), "Auburn" (BTR 267).

CLASS 123. FEMALE GOAT, any age, in Milk, entered in or eligible for the Saanen Section or the British Saanen Section or Register of the Herd-Book.—PREMIUMS, £3, £2, and £1.

1st No. 1104 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Middleton Myrtle" (S 287).

EXTRA STOCK.

The following received an award of £3 :—

No. 1105 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Dissington Silvia" (S 261).

CLASS 124. FEMALE GOAT, any age, in Milk. Any other variety. —PREMIUMS, £3, £2, and £1.

1st No. 1107 Hendy, Mrs, Etherley, Bishop Auckland, (Anglo-Nubian), "Jasmin of Coltishall" (AN 2397).
3rd No 1106 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British), "Dupplin Ecstasy" (10,249).

EXTRA STOCK.

The following received an award of £1 :—

No. 1108 Miller, Miss K. M. A., Lawmuir, Methven, Perth, (British), "Cobalt Couplet Q*" (9364).

CLASS 125. GOATLING, over one but not exceeding two years, entered in or eligible for the Toggenburg Section or the British Toggenburg or British Alpine Section or Register of the Herd-Book.—PREMIUMS, £3, £2, and £1.

1st No. 1109 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Juniper" (BA 1176).
2nd No. 1110 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Jubilate" (BAR 500).
3rd No. 1111 Miller, Miss K. M. A., Lawmuir, Methven, Perth, (British Toggenburg), "Lawmuir Change" (BTR 262).

CLASS 126. GOATLING, over one but not exceeding two years. Any other variety.—PREMIUMS, £3, £2, and £1.

1st No. 1116 Thomson, Mrs L., 1 Craigieknowes Road, Craigie, Perth, (British), "Clematis of Craigie" (12,568).
2nd No. 1112 Hendy, Mrs, Etherley, Bishop Auckland, (Anglo-Nubian), "Middleton Matchless" (AN 2497).
3rd No. 1114 Paisley, Mrs T. Leo, Parkhurst, Park Road, Harrogate, (British), "Kinneddar Jay" (12,554).

CLASS 127. FEMALE KID, not exceeding one year. Any variety. —PREMIUMS, £3, £2, and £1.

1st No. 1120 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Middleton Maisie" (S 398).
2nd No. 1117 Dunlop, Miss I. C., Parkhurst, Park Road, Harrogate, (Toggenburg), "Day" (T 853).
3rd No. 1119 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British), "Dupplin Kindliness" (12,811).
V No. 1121 Paisley, Mrs T. Leo, Parkhurst, Park Road, Harrogate, (British), "Kinneddar Blackbird Q*" (12,821).
H No. 1118 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Kiteflyer" (BA 1299).

CLASS 128. MALE KID, not exceeding one year. Any variety.—PREMIUMS, £3, £2, and £1.

1st No. 1123 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Etherley Musk" (S 397).

CLASS 129. MILKING COMPETITION, for quality, open to Classes 122, 123, and 124.—PREMIUMS, £3, £2, and £1.

1st No. 1105 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Dissington Silvia" (S 261).
2nd No. 1104 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Middleton Myrtle" (S 287).
3rd No. 1107 Hendy, Mrs, Etherley, Bishop Auckland, (Anglo-Nubian), "Jasmin of Coltishall" (AN 2397).

CLASS 130. MILKING COMPETITION, for quantity, open to Classes 122, 123, and 124.—PREMIUMS, £3, £2, and £1.

1st No. 1105 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Dissington Silvia" (S 261).
2nd No. 1106 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British), "Dupplin Ecstasy" (10,249).
3rd No. 1104 Hendy, Mrs, Etherley, Bishop Auckland, (Saanen), "Middleton Myrtle" (S 287).
V No. 1099 Forteviot, Dowager Lady, Galloway House, Garlieston, Wigtownshire, (British Alpine), "Dupplin Harpist" (BA 1101).

PIGS

LARGE WHITE.

PRESIDENT'S CHAMPION MEDAL for best Large White Pig.

No. 1127 Cox, J. Ernest, Methven Castle, Methven, "Berkswell Jay 15th" (98,153) (Ear No. 1430).

Reserve—No. 1189 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Princess 11th" (259,624) (Ear No. 5358).

Dundee Citizens' Perpetual Silver Challenge Cup, value about £50, *for the best Large White Pig, "Extra Stock" eligible to compete.* This Cup was presented by the Citizens of Dundee to commemorate the holding of the Society's Annual Show at Dundee in 1933.

No. 1127 Cox, J. Ernest, Methven Castle, Methven, "Berkswell Jay 15th" (98,153) (Ear No. 1430).

Gold Medal, value £5 (or cash), *for best Large White Boar, "Extra Stock" eligible to compete.* Given by the National Pig-Breeders' Association.

No. 1127 Cox, J. Ernest, Methven Castle, Methven, "Berkswell Jay 15th" (98,153) (Ear No. 1430).

Special Prizes for Groups of four Large White Pigs bred by Exhibitor. One Boar (at least) must be included in the Group, and not more than one entry to be selected from any one class. "Extra Stock" eligible to compete. —PREMIUMS, £5, £3, and £2. Given by the National Pig-Breeders' Association.

1st Nos. 1136, 1143, 1172, 1189 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh.

2nd Nos. 1162, 1174, 1207, 1228 Elder, Captain A. J., City Mills, Dunfermline.

3rd Nos. 1131, 1166, 1195, 1232 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire.

CLASS 131. BOAR, born before 1936.—PREMIUMS, £8, £4, and £2.

1st No. 1127 Cox, J. Ernest, Methven Castle, Methven, "Berkswell Jay 15th" (98,153) (Ear No. 1430).

2nd No. 1133 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, "Walton Boy 126th" (91,353) (Ear No. 4441).

3rd No. 1125 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Prince Charlie" (88,791) (Ear No. 4255).

V No. 1135 Wilson-Smith, Dr W. A., Cumledge, Duns, "Cumledge Chieftain 3rd" (98,869) (Ear No. 199).

H No. 1128 Elder, Captain A. J., City Mills, Dunfermline, "Wall King David 83rd" (101,635) (Ear No. 7087).

C No. 1131 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire, "Dunmore Banner 9th" (93,637) (Ear No. 1018).

C No. 1132 Stodart, J. A., Kingston, North Berwick, "Boghall Bandmaster" (Ear No. 275).

CLASS 132. BOAR, born in 1936 before 1st July —Premiums, £8, £4, and £2

1st No. 1136 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Highland Jay 14th" (99,323) (Ear No. 5341).
2nd No. 1138 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Boy 17th" (101,315) (Ear No. 5843).
3rd No. 1139 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Champion Boy" (Ear No. 6034).
C No. 1137 Taylor, G. C., Moncur, Inchture, Perthshire, "Moncur Jay 5th" (100,249) (Ear No. 501).

CLASS 133. BOAR, born in 1936 on or after 1st July.—Premiums, £6, £4, and £2.

1st No. 1143 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Mandate 18th" (Ear No. 5704).
2nd No 1153 Taylor, G. C., Moncur, Inchture, Perthshire, "Moncur Prince Albert 2nd" (Ear No. 655).
3rd No 1144 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Mandate 19th" (Ear No. 5743).
V No. 1149 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire, "Walton King David 82nd" (Ear No. 6204).
H No. 1154 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Major 31st" (Ear No. 6120).
C No. 1145 Elder, Captain A. J., City Mills, Dunfermline, "Touch Bradbury 21st" (Ear No. 1526).

CLASS 134. BOAR, born in 1937.—Premiums, £6, £3, and £1.

1st No. 1162 Elder, Captain A. J., City Mills, Dunfermline, "Touch King David 3rd" (Ear No. 1585).
2nd No. 1166 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire, "Dunmore Banner 15th" (Ear No. 1485).
3rd No. 1160 Cowper, John E. B., Gogar House, Corstorphine, Edinburgh, "Gogar Prince Charlie 11th" (Ear No. 6079).
V No. 1167 Lambie, David B., 22 Drummie Road, Devonside, Tillicoultry (Ear No. 90).
C No. 1159 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Prince Charlie 10th" (Ear No. 6076).
C No. 1161 Cox, J. Ernest, Methven Castle, Methven, "Methven Jay" (Ear No. 1105).
C No. 1164 Gellan, Edward B., Halbeath Pig Farm, Kingseat, Dunfermline, "Halbeath Kingmaker 4th" (Ear No 1191).

Gold Medal, value £5 (or cash), *for best Large White Sow, " Extra Stock " eligible to compete* Given by the National Pig Breeders' Association.

No. 1189 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, " Gogar Princess 11th " (259,624) (Ear No. 5358).

CLASS 135. SOW, born before 1936.—PREMIUMS, £8, £4, and £2.

1st No. 1172 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, " Gogar Princess 9th " (259,620) (Ear No. 5035).
2nd No. 1180 M'Nair, G. & H., Lewisville, Musselburgh, " Morningside Mary 3rd " (236,288) (Ear No. 286).
3rd No. 1183 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, " Tockwith Blackberry 78th " (238,854) (Ear No. 4115).
V No. 1182 Taylor, G. C., Moncur, Inchture, Perthshire, " Moncur Kate 10th " (248,928) (Ear No. 268).
H No. 1173 Cox, J. Ernest, Methven Castle, Methven, " Methven Perfect Bella 3rd " (235,950) (Ear No. 249).
C No. 1174 Elder, Captain A. J., City Mills, Dunfermline, " Touch Champion Queen 3rd " (238,990) (Ear No. 810).
C No. 1176 Ferguson, W. & J., Bankhead of Raith, Kirkcaldy, " Raith Dainty Girl 16th " (262,688) (Ear No. 64).

EXTRA STOCK.

The following received an award of £3 :—

No. 1186 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, " Whittingham Hilda 21st " (240,236) (Ear No. 2232).

CLASS 136. SOW, born in 1936 before 1st July.—PREMIUMS, £8, £4, and £2.

1st No. 1189 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, " Gogar Princess 11th " (259,624) (Ear No. 5358).
2nd No. 1188 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, " Gogar Blackberry 42nd " (259,536) (Ear No. 5333).
3rd No. 1195 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire, " Dunmore Buttercup 4th " (258,824) (Ear No. 1319).
V No. 1198 Taylor, G. C., Moncur, Inchture, Perthshire, " Moncur Kate 14th " (261,742) (Ear No. 505).
C No. 1199 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, " Tockwith Blackberry 135th " (Ear No. 6007).
C No. 1197 Taylor, G. C., Moncur, Inchture, Perthshire, " Moncur Kate 13th " (261,740) (Ear No. 503).
C No. 1190 Cox, J. Ernest, Methven Castle, Methven, " Methven Perfect Bella 7th " (Ear No. 766).
C No. 1200 Wilson-Smith, Dr W. A., Cumledge, Duns, " Cumledge Dahlia 23rd " (Ear No. 314).

CLASS 137. SOW, born in 1936 on or after 1st July.—PREMIUMS, £6, £4, and £2.

1st No. 1217 Thomlinson, E., & Son, Hall Farm, Hutton Wandesley, Marston, York, "Walton Queen Mary 95th" (Ear No. 6088).
2nd No. 1207 Elder, Captain A. J., City Mills, Dunfermline, "Touch Champion Queen 21st" (Ear No. 1466).
3rd No. 1204 Cowper, John E. B., Gogar House, Corstorphine, Edinburgh, "Gogar Blackberry 44th" (Ear No. 5807).
V No. 1212 Lawson, Thomas, Kirkforthar, Markinch, Fife, "Kirkforthar Blackberry 6th" (Ear No. 11).
H No. 1214 Taylor, G. C., Moncur, Inchture, Perthshire, "Moncur Topsie 8th" (Ear No. 615).
C No. 1202 Cavaghan & Gray, Ltd., Harraby, Carlisle, "Harraby Mary" (Ear No. 28).
C No. 1203 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory, Springfield, Fife (Ear No. 2043).
C No. 1210 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire, "Dunmore Champion Queen 3rd" (Ear No. 1393).

CLASS 138. SOW, born in 1937.—PREMIUMS, £6, £3, and £1.

1st No. 1232 Jones, Messrs, Dunmore Park, Dunmore, Stirlingshire, "Dunmore Champion Queen 4th" (Ear No. 1489).
2nd No. 1228 Elder, Captain A. J., City Mills, Dunfermline, "Touch Lady Belle 18th" (Ear No. 1590).
3rd No. 1227 Cox, J. Ernest, Methven Castle, Methven, "Methven Canna 2nd" (Ear No. 1083).
V No. 1239 Taylor, G. C., Moncur, Inchture, Perthshire, "Moncur Blossom 9th" (Ear No. 743).
H No. 1238 Taylor, G. C., Moncur, Inchture, Perthshire, "Moncur Blossom 8th" (Ear No. 742).
C No. 1224 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory, Springfield, Fife (Ear No. 2361).
C No. 1225 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Betty 27th" (Ear No. 6080).

LARGE BLACK.

PRESIDENT'S CHAMPION MEDAL for best Large Black Pig.

No. 1243 Warth, E. A., Upwood Hill House, Ramsey, Huntingdon, "Pakenham Sundial 2nd" (K 243).

Reserve—No. 1251 Elder, J. S., East Bearford, Haddington, "Bearford Beautiful" (P 90).

Silver Medal *for the best Large Black Boar.* Given by the Large Black Pig Society.

No. 1243 Warth, E. A., Upwood Hill House, Ramsey, Huntingdon, "Pakenham Sundial 2nd" (K 243).

CLASS 139. BOAR, born before 1937.—PREMIUMS, £8, £4, and £2.

1st No. 1243 Warth, E. A., Upwood Hill House, Ramsey, Huntingdon, "Pakenham Sundial 2nd" (K 243).
2nd No. 1241 Stephen, A. Murray, Balgray, Balbeggie, Perthshire, "Yam Probation 1st" (M 157).
3rd No. 1240 Elder, J. S., East Bearford, Haddington, "Pakenham Bodyline 1st" (M 223).
V No 1242 Stephen, A. Murray, Balgray, Balbeggie, Perthshire, "Leckford Conspirator" (P 345).

CLASS 140. BOAR, born in 1937.—PREMIUMS, £6, £3, and £1.

1st No. 1244 Elder, J. S., East Bearford, Haddington, "Bearford Jack" (R 91).
2nd No. 1246 Warth, E. A., Upwood Hill House, Ramsey, Huntingdon, "Upwood Contraband" (R 79).
3rd No. 1245 Stephen, A. Murray, Balgray, Balbeggie, Perthshire, "Yam Coronation" (R 75)

Silver Medal *for the best Large Black Sow.* Given by the Large Black Pig Society

No 1251 Elder, J S, East Bearford, Haddington, "Bearford Beautiful" (P 90).

CLASS 141. SOW, born before 1936.—PREMIUMS, £8, £4, and £2.

1st No. 1250 Warth, E. A., Upwood Hill House, Ramsey, Huntingdon, "Upwood Echo" (M 1484).
2nd No 1247 Elder, J. S., East Bearford, Haddington, "Bearford Jill 22nd" (L 1016).
3rd No. 1249 Elder, J. S., East Bearford, Haddington, "Bearford Jane" (N 1290).
V No. 1248 Elder, J. S., East Bearford, Haddington, "Bearford Bounty 4th" (M 972).

CLASS 142. SOW, born in 1936—PREMIUMS, £8, £4, and £2.

1st No. 1251 Elder, J. S., East Bearford, Haddington, "Bearford Beautiful" (P 90).
2nd No. 1254 Stephen, A. Murray, Balgray, Balbeggie, Perthshire, "Yam Erica 36th" (P 1342).
3rd No. 1253 Stephen, A. Murray, Balgray, Balbeggie, Perthshire, "Yam Ethel 1st" (P 1212).
V No. 1252 Elder, J. S., East Bearford, Haddington, "Bearford Moonlight 8th" (P 1340).

CLASS 143. SOW, born in 1937.—PREMIUMS, £6, £3, and £1.

1st No. 1258 Warth, E. A., Upwood Hill House, Ramsey, Huntingdon, "Upwood Level Sides 7th" (R 204).
2nd No. 1257 Stephen, A. Murray, Balgray, Balbeggie, Perthshire, "Yam Ethel 3rd" (R 200).

POULTRY

First Premium—Twenty Shillings. Second Premium—Ten Shillings. In each Class in which there are four or more entries a Third Prize of Five Shillings may be awarded, provided there is sufficient merit in the pens.

Champion Challenge Silver Salver, value £30, *for the best Exhibit in the Poultry Classes.* Given by the late Lord Dewar.

No. 128 Binnie, W., & Son, Garth House, Denny.

Champion Silver Medals are offered as follows :—

1. *Best Cock, any Variety.*

No. 128 Binnie, W., & Son, Garth House, Denny.

2. *Best Hen, any Variety.*

No. 175 Wilson, T. G., Carbeth Home Farm, Balfron Station.

3. *Best Cockerel, any Variety.*

No. 94 Orr, James D., Gargunnock, Stirling.

4. *Best Pullet, any Variety.*

No. 342 Delaney, James, & Son, Gateside, Fife.

5. *Best Waterfowl.*

No. 483 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

6. *Best Turkey.*

No. 520 Andrew, Mrs J., South Tulloford, Oldmeldrum.

7. *Best Utility Bird (Classes* 82-97).

No. 377 Binnie, W., & Son, Garth House, Denny.

CLASS 1. LEGHORN—White—Cock.

1st No. 4 Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
2nd No. 2 Binnie, W., & Son, Garth House, Denny.
3rd No. 1 Arnott, David, Easter Frew, Kippen.
V No. 5 Scott, James, Sornhill, Galston.

CLASS 2. LEGHORN—White—Hen.

1st	No. 6	Binnie, W., & Son, Garth House, Denny.
2nd	No. 10	Scott, James, Sornhill, Galston.
3rd	No. 8	Harbottle, Mr and Mrs R. P, Albion House, Great Ayton, Yorks.
V	No. 9	Robertson, R., 8 Waterworks Road, Deal, Kent.
H	No. 7	Guthrie, Peter F., South Croft, Auchterarder.

CLASS 3. LEGHORN—White—Cockerel.

1st	No. 11	Binnie, W., & Son, Garth House, Denny.
2nd	No. 12	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.

CLASS 4. LEGHORN—White—Pullet.

1st	No. 14	Binnie, W., & Son, Garth House, Denny.
2nd	No. 15	Guthrie, Peter F., South Croft, Auchterarder.
3rd	No. 17	Robertson, R., 8 Waterworks Road, Deal, Kent.
V	No. 18	Robertson, R., 8 Waterworks Road, Deal, Kent.

CLASS 5. LEGHORN—Any other Colour—Cock.

1st	No. 19	Brown, Charles D., Ivy Bank, Kintore (Brown).
2nd	No. 21	Livingstone, John, Peel Hill, Strathaven (Brown).
V	No. 20	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Black).

CLASS 6. LEGHORN—Any other Colour—Hen.

1st	No. 28	Ross, J. C., Stirling Road, Larbert (Black).
2nd	No. 29	Ross, J. C., Stirling Road, Larbert (Black).
3rd	No. 26	M'Pherson, R., Drumboy, Strathaven (Black).
V	No. 27	Mealls, David, 16 West Borland Road, Denny (Brown).
H	No. 30	Rutherford, A., & Son, Parliament Square, Kinross (Black).

CLASS 7. LEGHORN—Any other Colour—Cockerel.

1st	No. 32	Hearn, John, Linkinhorne, Callington, Cornwall (Brown).
2nd	No. 33	Livingstone, John, Peel Hill, Strathaven (Brown).

CLASS 8. LEGHORN—Any other Colour—Pullet.

1st	No. 36	Mealls, David, 16 West Borland Road, Denny (Brown).
2nd	No. 34	Hearn, John, Linkinhorne, Callington, Cornwall (Brown).
V	No. 35	Kirkwood, R. A., Camelon Hotel, Falkirk (Exchequer).

CLASS 9. MINORCA—Cock.

1st	No. 38	Binnie, W., & Son, Garth House, Denny.
2nd	No. 42	Russell, John, Tinto View, Pettinain, Lanark.
3rd	No. 40	Graham, John, Kirkfield, Lanark.
V	No. 37	Arnott, David, Easter Frew, Kippen.

CLASS 10. MINORCA—Hen.

1st	No. 43	Anderson, James, Kirkhall, Ardrossan.
2nd	No. 51	Russell, John, Tinto View, Pettinain, Lanark.
3rd	No. 46	Dalrymple, John, & Son, Meadowview, Leslie.
V	No. 47	Graham, John, Kirkfield, Lanark.
H	No. 48	Graham, John, Kirkfield, Lanark.

CLASS 11. MINORCA—Cockerel.

1st	No. 54	Graham, John, Kirkfield, Lanark.
2nd	No. 52	Binnie, W., & Son, Garth House, Denny.
3rd	No. 55	Russell, John, Tinto View, Pettinain, Lanark

CLASS 12. MINORCA—Pullet.

1st	No. 57	Graham, John, Kirkfield, Lanark.
2nd	No. 59	Macgregor, James S., High Street, Greenlaw.
3rd	No. 56	Binnie, W., & Son, Garth House, Denny.
V	No. 58	Hamilton, Thomas, Kirkton Kilns, Bathgate.

CLASS 13. SCOTCH GREY—Cock.

1st	No. 61	Carswell, John, Hazel Bank, Graham's Road, Falkirk.
2nd	No. 62	Ramsay, William, Busbie Farm, Crosshouse, Kilmarnock.
3rd	No. 65	Young, Dr Stephen, 6 Woodside Place, Glasgow.
V	No. 63	Ramsay, William, Busbie Farm, Crosshouse, Kilmarnock.
H	No. 64	Young, Dr Stephen, 6 Woodside Place, Glasgow.

CLASS 14. SCOTCH GREY—Hen.

1st	No. 71	Ramsay, William, Busbie Farm, Crosshouse, Kilmarnock.
2nd	No. 68	Kelso, Hugh, Roadside Cottage, Plean.
3rd	No. 74	Young, Dr Stephen, 6 Woodside Place, Glasgow.
V	No. 75	Young, Dr Stephen, 6 Woodside Place, Glasgow.
H	No. 72	Ramsay, William, Busbie Farm, Crosshouse, Kilmarnock.
C	No. 73	Young, Dr Stephen, 6 Woodside Place, Glasgow.

CLASS 15. SCOTCH GREY—Cockerel.

1st	No. 76	Carswell, John, Hazel Bank, Graham's Road, Falkirk.
3rd	No. 77	Grant, Alexander, Mid Thorn Farm, Falkirk.

CLASS 16. SCOTCH GREY—Pullet.

1st	No. 80	Carswell, John, Hazel Bank, Graham's Road, Falkirk.
2nd	No. 81	Grant, Alexander, Mid Thorn Farm, Falkirk.
V	No. 83	Young, Dr Stephen, 6 Woodside Place, Glasgow.

CLASS 17. PLYMOUTH ROCK—Barred—Cock.

1st	No. 85	Brown, Charles D., Ivy Bank, Kintore.
2nd	No. 84	Allenby, E. W., Three Oaks, Virginia Water, Surrey.
3rd	No. 87	Orr, James D., Gargunnock, Stirling.
V	No. 86	Orr, James D., Gargunnock, Stirling.
H	No. 88	Scott, Alexander, Cockridge View, Lanark.

CLASS 18. PLYMOUTH ROCK—Barred—Hen.

1st	No. 90	Brown, Charles D., Ivy Bank, Kintore.
2nd	No. 92	Orr, James D., Gargunnock, Stirling.
3rd	No. 89	Allenby, E. W., Three Oaks, Virginia Water, Surrey.
V	No. 91	Orr, James D., Gargunnock, Stirling.

CLASS 19. PLYMOUTH ROCK—Barred—Cockerel.

1st	No. 94	Orr, James D., Gargunnock, Stirling.
2nd	No. 95	Orr, James D., Gargunnock, Stirling.
V	No. 93	Allenby, E. W., Three Oaks, Virginia Water, Surrey.

CLASS 20. PLYMOUTH ROCK—Barred—Pullet.

1st	No. 97	Orr, James D., Gargunnock, Stirling.
2nd	No. 98	Orr, James D., Gargunnock, Stirling.
V	No. 96	Allenby, E. W., Three Oaks, Virginia Water, Surrey.

CLASS 21. PLYMOUTH ROCK—Any other Colour—Cock or Cockerel.

1st	No. 104	Orr, James D., Gargunnock, Stirling (Buff).
2nd	No. 102	Orr, James D., Gargunnock, Stirling (Columbian).
3rd	No. 100	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (White).
V	No. 103	Orr, James D., Gargunnock, Stirling (White).
H	No. 101	Laurie, Mrs, Kettlestoun Mains, Linlithgow (Buff).

CLASS 22. PLYMOUTH ROCK—Any other Colour—Hen or Pullet.

1st	No. 105	Argo, Mrs Tom, Boquhan, Balfron (White).
2nd	No. 106	Orr, James D., Gargunnock, Stirling (Buff).
3rd	No. 108	Orr, James D., Gargunnock, Stirling (Columbian).
V	No. 107	Orr, James D., Gargunnock, Stirling (White).
H	No. 109	Ronald, John R., Dorrator, Milnathort (Buff).

CLASS 23. ORPINGTON—Black—Cock or Cockerel.

1st	No. 111	M'Pherson, R., Drumboy, Strathaven.
2nd	No. 113	Orr, James D., Gargunnock, Stirling.
3rd	No. 115	Reid, David, Firthview, Portgordon.
V	No. 112	Orr, James D., Gargunnock, Stirling.
H	No. 114	Patton & Son, 12 The Crescent, Luncarty, Perth.

CLASS 24. ORPINGTON—Black—Hen or Pullet.

1st	No. 116	Burdett, John, 1 Lake Bank Terrace, Wingate, Co. Durham.
2nd	No. 122	Reid, David, Firthview, Portgordon.
3rd	No. 120	Patton & Son, 12 The Crescent, Luncarty, Perth.
V	No. 121	Reid, David, Firthview, Portgordon.
H	No. 119	Orr, James D., Gargunnock, Stirling.
C	No. 118	Orr, James D., Gargunnock, Stirling.

CLASS 25. ORPINGTON—Any other Colour—Cock or Cockerel.

1st	No. 123	Orr, James D., Gargunnock, Stirling (Buff).
V	No. 124	Orr, James D., Gargunnock, Stirling (Blue).

CLASS 26. ORPINGTON—Any other Colour—Hen or Pullet.

1st	No. 126	Orr, James D., Gargunnock, Stirling (Buff).
3rd	No. 125	Orr, James D., Gargunnock, Stirling (Blue).

CLASS 27. WYANDOTTE—White—Cock.

1st	No. 128	Binnie, W., & Son, Garth House, Denny.
2nd	No. 129	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
V	No. 127	Arnott, David, Easter Frew, Kippen.

CLASS 28. WYANDOTTE—White—Hen.

1st	No. 131	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
2nd	No. 130	Binnie, W., & Son, Garth House, Denny.
V	No. 132	Reid, David, Firthview, Portgordon.

CLASS 29. WYANDOTTE—White—Cockerel.

1st	No. 136	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
2nd	No. 134	Barton, John, Burtree Farm, Sessay, Thirsk.
3rd	No. 135	Binnie, W., & Son, Garth House, Denny.
V	No. 133	Arnott, David, Easter Frew, Kippen.

CLASS 30. WYANDOTTE—White—Pullet.

1st	No. 137	Barton, John, Burtree Farm, Sessay, Thirsk.
2nd	No. 138	Binnie, W., & Son, Garth House, Denny.
3rd	No. 139	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
V	No. 140	Orr, James D., Gargunnock, Stirling.

CLASS 31. WYANDOTTE—Partridge or Columbian—Cock or Cockerel.

1st	No. 141	Brown, Charles D., Ivy Bank, Kintore (Partridge).
2nd	No. 142	Brown, Fred, Woodside, Grimscar, Huddersfield (Columbian).

CLASS 32. WYANDOTTE—Partridge or Columbian—Hen or Pullet.

1st	No. 143	Brown, Charles D., Ivy Bank, Kintore (Partridge).
2nd	No. 144	Brown, Fred, Woodside, Grimscar, Huddersfield (Columbian).
V	No. 145	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Partridge).

CLASS 33. WYANDOTTE—Any other Colour—Cock or Cockerel.

1st	No. 147	Spensley, Herbert, Oaks Farm, Menston-in-Wharfedale, Leeds (Gold).
2nd	No. 146	Morgan, William, Balcurvie, Windygates (Gold).

CLASS 34. WYANDOTTE—Any other Colour—Hen or Pullet.

1st	No. 149	Spensley, Herbert, Oaks Farm, Menston-in-Wharfedale, Leeds (Silver).
2nd	No. 148	Hamilton, Thomas, Kirkton Kilns, Bathgate (Silver).

CLASS 35. RHODE ISLAND RED—Cock.

1st	No. 156	Reid, David, Firthview, Portgordon.
2nd	No. 154	Morgan, William, Balcurvie, Windygates.
3rd	No. 155	Reid, David, Firthview, Portgordon.
V	No. 150	Aikman, Robert, Molney Green Cottage, Rhu, Helensburgh.
H	No. 153	Mitchell, William, Fowler, Mauchline.
C	No. 151	Brown, Charles D., Ivy Bank, Kintore.

CLASS 36. RHODE ISLAND RED—Hen.

1st	No. 161	Reid, David, Firthview, Portgordon.
2nd	No. 158	Allan, William, Newcastle, Halbeath, Dunfermline.
3rd	No. 160	Reid, David, Firthview, Portgordon.
V	No. 159	Morgan, William, Balcurvie, Windygates.
H	No. 157	Allan, William, Newcastle, Halbeath, Dunfermline.

CLASS 37. RHODE ISLAND RED—Cockerel.

1st	No. 163	Reid, David, Firthview, Portgordon.
2nd	No. 164	Reid, David, Firthview, Portgordon.
V	No. 162	Dickson, John H., Howlet's Ha', Gordon, Berwickshire.

CLASS 38. RHODE ISLAND RED—Pullet.

1st	No. 167	Reid, David, Firthview, Portgordon.
2nd	No. 166	Reid, David, Firthview, Portgordon.
3rd	No. 165	Morgan, William, Balcurvie, Windygates.
V	No. 168	Shewan, Alexander, Longhillock, Alves, Forres.

CLASS 39. SUSSEX—Light—Cock.

1st	No. 171	Wilson, T. G., Carbeth Home Farm, Balfron Station.
2nd	No. 169	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton. Yorks.
C	No. 170	Morgan, William, Balcurvie, Windygates.

CLASS 40. SUSSEX—Light—Hen.

1st	No. 175	Wilson, T. G., Carbeth Home Farm, Balfron Station.
2nd	No. 176	Wilson, T. G., Carbeth Home Farm, Balfron Station.
3rd	No. 173	Morgan, William, Balcurvie, Windygates.
V	No. 172	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
C	No. 174	Shewan, Alexander, Longhillock, Alves, Forres.

CLASS 41. SUSSEX—Light—Cockerel.

1st	No. 179	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
2nd	No. 177	Barton, John, Burtree Farm, Sessay, Thirsk.
C	No. 178	Cruickshank, A., Jun., West Leys, Lessendrum, Huntly.

CLASS 42. SUSSEX—Light—Pullet.

1st	No. 182	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
2nd	No. 180	Barton, John, Burtree Farm, Sessay, Thirsk.
C	No. 181	Hamilton, Thomas, Kirkton Kilns, Bathgate.

CLASS 43. SUSSEX—Any other Variety—Cock.

1st	No. 183	Greenhow & Hartley, Galaberry Poultry Farm, Annan (White).

CLASS 44. SUSSEX—Any other Variety—Hen.

1st	No. 184	Greenhow & Hartley, Galaberry Poultry Farm, Annan (White).
2nd	No. 185	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Speckled).
C	No. 187	Morgan, William, Balcurvie, Windygates (White).

CLASS 45. SUSSEX—Any other Variety—Cockerel.

1st	No. 188	Greenhow & Hartley, Galaberry Poultry Farm, Annan (White).

CLASS 46. SUSSEX—Any other Variety—Pullet.

1st	No. 189	Greenhow & Hartley, Galaberry Poultry Farm, Annan (White).

CLASS 47. DORKING—Coloured—Cock.

1st	No. 190	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 191	Major, A. J., Ditton, Langley, Bucks.

CLASS 48. DORKING—Coloured—Hen.

1st	No. 192	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 193	Major, A. J., Ditton, Langley, Bucks.

CLASS 49. DORKING—Coloured—Cockerel.

1st	No. 194	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 195	Major, A. J., Ditton, Langley, Bucks.

CLASS 50. DORKING—Coloured—Pullet.

1st	No. 196	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 197	Major, A. J., Ditton, Langley, Bucks.

CLASS 51. DORKING—Silver Grey—Cock.

1st	No. 198	Bryce, William, Snaigow, Murthly.
2nd	No. 199	Major, A. J., Ditton, Langley, Bucks.

CLASS 52. DORKING—Silver Grey—Hen.

1st	No. 205	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 204	Kirkwood, R. A., Camelon Hotel, Falkirk.
3rd	No. 201	Bryce, William, Snaigow, Murthly.
C	No. 202	Bryce, William, Snaigow, Murthly.

CLASS 53. DORKING—Silver Grey—Cockerel.

1st	No. 210	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 211	Major, A. J., Ditton, Langley, Bucks.
3rd	No. 209	Gunn, Angus S., Glen Mavis House, Bathgate.
V	No. 208	Cruickshank, A., Jun., West Leys, Lessendrum, Huntly.

CLASS 54. DORKING—Silver Grey—Pullet.

1st	No. 213	Major, A. J., Ditton, Langley, Bucks.
2nd	No. 214	Major, A. J., Ditton, Langley, Bucks.
C	No. 212	Cruickshank, A., Jun., West Leys, Lessendrum, Huntly.

CLASS 55. SCOTS DUMPY—Cock.

1st	No. 216	Kerr, J. E., of Harviestoun, Dollar.
2nd	No. 215	Kerr, J. E., of Harviestoun, Dollar.
3rd	No. 217	Kerr, J. E., of Harviestoun, Dollar.
V	No. 218	Major, A. J., Ditton, Langley, Bucks.

CLASS 56. SCOTS DUMPY—Hen.

1st	No. 221	Kerr, J. E., of Harviestoun, Dollar.
2nd	No. 220	Kerr, J. E., of Harviestoun, Dollar.
3rd	No. 219	Kerr, J. E., of Harviestoun, Dollar.
V	No. 222	Major, A. J., Ditton, Langley, Bucks.

CLASS 57. SCOTS DUMPY—Cockerel or Pullet.

1st	No. 223	Kerr, J. E., of Harviestoun, Dollar.
3rd	No. 224	Kerr, J. E., of Harviestoun, Dollar.

CLASS 58. BARNEVELDER—Cock.

1st	No. 226	Burdett, John, 1 Lake Bank Terrace, Wingate, Co. Durham
2nd	No. 227	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
3rd	No. 228	Montrose, The Duchess of, Brodick Castle, Arran.
V	No. 225	Binnie, W., & Son, Garth House, Denny.
H	No. 229	Morgan, William, Balcurvie, Windygates.

CLASS 59. BARNEVELDER—Hen.

1st	No. 235	Kirkwood, R. A., Camelon Hotel, Falkirk.
2nd	No. 234	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks.
3rd	No. 232	Binnie, W., & Son, Garth House, Denny.
V	No. 238	Whitton, A., Aiskew, Bedale, Yorks.
H	No. 233	Burdett, John, 1 Lake Bank Terrace, Wingate, Co. Durham.
C	No. 237	Morgan, William, Balcurvie, Windygates.

CLASS 60. BARNEVELDER—Cockerel.

1st	No. 242	Whitton, A., Aiskew, Bedale, Yorks.
2nd	No. 241	Morgan, William, Balcurvie, Windygates.
3rd	No. 240	Burdett, John, 1 Lake Bank Terrace, Wingate, Co. Durham.
V	No. 239	Binnie, W., & Son, Garth House, Denny.

CLASS 61. BARNEVELDER—Pullet.

1st	No. 244	Burdett, John, 1 Lake Bank Terrace, Wingate, Co. Durham.
2nd	No. 246	Whitton, A., Aiskew, Bedale, Yorks.
3rd	No. 243	Binnie, W., & Son, Garth House, Denny.
V	No. 245	Morgan, William, Balcurvie, Windygates.

CLASS 62. INDIAN GAME—Cock.

1st	No. 249	Kirkwood, R. A., Camelon Hotel, Falkirk.
2nd	No. 248	Brent, Cecil, Clampit, Callington, Cornwall.
V	No. 247	Black, William A. P., Croftfoot, Old Polmont.

CLASS 63. INDIAN GAME—Hen.

1st	No. 250	Black, William A. P., Croftfoot, Old Polmont.
2nd	No. 251	Brent, Cecil, Clampit, Callington, Cornwall.

CLASS 64. INDIAN GAME—Cockerel.

1st	No. 253	Brent, Cecil, Clampit, Callington, Cornwall.
2nd	No. 252	Black, William A. P., Croftfoot, Old Polmont.

CLASS 65. INDIAN GAME—Pullet.

1st	No. 255	Brent, Cecil, Clampit, Callington, Cornwall.
2nd	No. 254	Black, William A. P., Croftfoot, Old Polmont.

CLASS 66. OLD ENGLISH GAME—Cock.

1st	No. 258	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
2nd	No. 264	Telford, William, Breconside, Brampton, Cumberland.
3rd	No. 260	Neilson, David, 61 Paterson Park, Leslie.
V	No. 257	Forster, James, & Son, Kirkhouse, Hallbankgate, Carlisle.
H	No. 256	Armstrong, Joseph J., Barclose, Scaleby, Carlisle.
C	No. 259	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
C	No. 265	Wilson, Captain C. W., Kirkland House, Wigton, Cumberland.

CLASS 67. OLD ENGLISH GAME—Hen.

1st	No. 270	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
2nd	No. 268	Allan, William, Newcastle, Halbeath, Dunfermline.
3rd	No. 273	Telford, William, Breconside, Brampton, Cumberland.
V	No. 271	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
H	No. 269	Armstrong, Joseph J., Barclose, Scaleby, Carlisle.
C	No. 272	Slater, A., The Old Vicarage, Lythe, Whitby, Yorks.
C	No. 275	Wilson, Captain C. W., Kirkland House, Wigton, Cumberland.

CLASS 68. OLD ENGLISH GAME—Cockerel.

1st	No. 276	Armstrong, Joseph J., Barclose, Scaleby, Carlisle.
2nd	No. 277	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
V	No. 278	Greenhow & Hartley, Galaberry Poultry Farm, Annan.

CLASS 69. OLD ENGLISH GAME—Pullet.

1st	No. 279	Armstrong, Joseph J., Barclose, Scaleby, Carlisle.
2nd	No. 281	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
V	No. 280	Greenhow & Hartley, Galaberry Poultry Farm, Annan.

CLASS 70. BANTAM GAME—Old English—Cock.

1st	No. 285	Greenhow & Hartley, Galaberry Poultry Farm, Annan.
2nd	No. 287	Inglis, A. C., & Son, 76 Balfour Street, Kirkcaldy.
3rd	No. 286	Inglis, A. C., & Son, 76 Balfour Street, Kirkcaldy.
V	No. 288	Morgan, William, Balcurvie, Windygates.
H	No. 283	Gegg, Rev. James, The Manse, Sorn, Ayrshire.
C	No. 289	Stuart, A. D., The Brighouse, Westfield, Bathgate.

CLASS 71. BANTAM GAME—Old English—Hen.

1st	No. 298	Kirkwood, R. A., Camelon Hotel, Falkirk.
2nd	No. 297	Inglis, A. C., & Son, 76 Balfour Street, Kirkcaldy.
3rd	No. 300	Stuart, A. D., The Brighouse, Westfield, Bathgate.
V	No. 293	Gegg, Rev. James, The Manse, Sorn, Ayrshire.
H	No. 299	Mowbray, John, Croft, Leslie.
C	No. 295	Greenhow & Hartley, Galaberry Poultry Farm, Annan.

CLASS 72. BANTAM GAME—Modern—Cock.

1st	No. 303	Delaney, James, & Son, Gateside, Fife.
2nd	No. 304	Sandison, A. L., Cowdray Arms Hotel, Echt, Aberdeenshire.
3rd	No. 305	Sandison, A. L., Cowdray Arms Hotel, Echt, Aberdeenshire.

CLASS 73. BANTAM GAME—Modern—Hen.

1st	No. 307	Sandison, A. L., Cowdray Arms Hotel, Echt, Aberdeenshire.
2nd	No. 308	Sandison, A. L., Cowdray Arms Hotel, Echt, Aberdeenshire.
3rd	No. 309	Sandison, A. L., Cowdray Arms Hotel, Echt, Aberdeenshire.

CLASS 74. BANTAM—Other than Game—Cock.

1st	No. 318	Otterson Brothers, Middlerigg Cottage, Sundrum, Ayr (Rosecomb).
2nd	No. 313	Dalrymple, John, & Son, Meadowview, Leslie (Minorca).
3rd	No. 322	Scott, James, Sornhill, Galston (Wyandotte, White).
V	No. 315	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Frizzled).
H	No. 317	Livingstone, John, Peel Hill, Strathaven (Sebright).
C	No. 311	Binnie, W., & Son, Garth House, Denny (Wyandotte, White).

CLASS 75. BANTAM—Other than Game—Hen.

1st	No. 330	Otterson Brothers, Middlerigg Cottage, Sundrum, Ayr (Rosecomb).
2nd	No. 333	Scott, James, Sornhill, Galston (Wyandotte, White).
3rd	No. 324	Binnie, W., & Son, Garth House, Denny (Wyandotte, White).
V	No. 327	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Sebright).
H	No. 329	Livingstone, John, Peel Hill, Strathaven (Sebright).

CLASS 76. BANTAM—Any Variety—Cockerel.

1st	No. 337	Delaney, James, & Son, Gateside, Fife (Modern Game).
2nd	No. 336	Delaney, James, & Son, Gateside, Fife (Modern Game).
3rd	No. 339	Greenhow & Hartley, Galaberry Poultry Farm, Annan (Old English Game).
V	No. 335	Binnie, W., & Son, Garth House, Denny (Wyandotte, White).

CLASS 77. BANTAM—Any Variety—Pullet.

1st	No. 342	Delaney, James, & Son, Gateside, Fife (Modern Game).
2nd	No. 343	Delaney, James, & Son, Gateside, Fife (Modern Game).
3rd	No. 346	Kirkwood, R. A., Camelon Hotel, Falkirk (Barnevelder).
V	No. 344	Delaney, James, & Son, Gateside, Fife (Wyandotte).
H	No. 345	Greenhow & Hartley, Galaberry Poultry Farm, Annan (Old English Game).

CLASS 78. ANY OTHER RECOGNISED BREED OF POULTRY —Cock.

1st	No. 352	Forsyth, John F., 75 Main Street, Clackmannan (Hamburgh).
2nd	No. 354	M'Vicar, Daniel, Burnside Cottage, Lennoxtown (Polish).
3rd	No. 357	Orr, James D., Gargunnock, Stirling (Welsummer).
V	No. 356	Orr, James D., Gargunnock, Stirling (Welsummer).

CLASS 79. ANY OTHER RECOGNISED BREED OF POULTRY —Hen.

1st	No. 361	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Modern Game).
2nd	No. 367	Rennie, Miss Jen, Glenview, Paisley (Brahma).
3rd	No. 359	Forsyth, John F., 75 Main Street, Clackmannan (Hamburgh).
V	No. 363	Kirkwood, R. A., Camelon Hotel, Falkirk (Polish).
H	No. 364	Miller, Robert C., & Son, Boghead, Dumbarton (Andalusian).
C	No. 362	Kirkwood, R. A., Camelon Hotel, Falkirk (Cochin).

CLASS 80. ANY OTHER RECOGNISED BREED OF POULTRY —Cockerel.

1st	No. 369	Orr, James D., Gargunnock, Stirling (Welsummer).
2nd	No. 368	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Ancona).
V	No. 370	Orr, James D., Gargunnock, Stirling (Welsummer).

CLASS 81. ANY OTHER RECOGNISED BREED OF POULTRY —Pullet.

1st	No. 373	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Ancona).
2nd	No. 372	Hamilton, Thomas, Kirkton Kilns, Bathgate (Frizzled).
3rd	No. 375	Orr, James D., Gargunnock, Stirling (Welsummer).
V	No. 374	Orr, James D., Gargunnock, Stirling (Welsummer).
H	No. 371	Glencross, James H., 26 Garry Park, Glencraig, Fife (Andalusian).

UTILITY POULTRY.

CLASS 82. LEGHORN—Any Variety—Cock or Cockerel.

1st	No. 377	Binnie, W., & Son, Garth House, Denny (White).
2nd	No. 376	Arnott, David, Easter Frew, Kippen (White).
3rd	No. 379	Livingstone, John, Peel Hill, Strathaven (Brown).

CLASS 83. ANY OTHER VARIETY—Light Breed—Cock or Cockerel.

1st	No. 382	Binnie, W., & Son, Garth House, Denny (Minorca).
2nd	No. 383	Binnie, W., & Son, Garth House, Denny (Minorca).
C	No. 381	Arnott, David, Easter Frew, Kippen (Minorca).
C	No. 384	Grant, Alexander, Mid Thorn Farm, Falkirk (Scotch Grey).

CLASS 84. WYANDOTTE—Any Colour—Cock or Cockerel.

1st	No. 391	Wharton, John, Honeycott Farm, Hawes, Yorks. (White).
2nd	No. 385	Binnie, W., & Son, Garth House, Denny (White).
3rd	No. 389	Orr, James D., Gargunnock, Stirling (White).
V	No. 392	Wharton, John, Honeycott Farm, Hawes, Yorks. (White).
H	No. 387	Livingstone, John, Peel Hill, Strathaven (White).
C	No. 386	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (White).

CLASS 85. RHODE ISLAND RED—Cock or Cockerel.

1st	No. 395	Dickson, John H., Howlet's Ha', Gordon, Berwickshire.
2nd	No. 396	Grant, Alexander, Mid Thorn Farm, Falkirk.
3rd	No. 400	Morgan, William, Balcurvie, Windygates.
V	No. 399	Mitchell, William, Fowler, Mauchline.
H	No. 393	Allan, William, Newcastle, Halbeath, Dunfermline.
C	No. 397	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.
C	No. 401	Reid, David, Firthview, Portgordon.

CLASS 86. WELSUMMER—Cock or Cockerel.

1st	No. 403	Orr, James D., Gargunnock, Stirling.
2nd	No. 404	Orr, James D., Gargunnock, Stirling.

CLASS 87. ANY OTHER VARIETY—Heavy Breed—Cock or Cockerel.

1st	No. 412	Orr, James D., Gargunnock, Stirling (Buff Rock).
2nd	No. 405	Beveridge, John, 24 North Square, Wellwood, Dunfermline (Australorp).
3rd	No. 410	Morgan, William, Balcurvie, Windygates (Light Sussex).
V	No. 408	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (Light Sussex).
H	No. 409	Macduff-Duncan, H., Lennoch Poultry Farm, Comrie (Light Sussex).
C	No. 411	Orr, James D., Gargunnock, Stirling (Buff Rock).

CLASS 88. LEGHORN—White—Hen or Pullet.

1st	No. 418	Orr, James D., Gargunnock, Stirling.
2nd	No. 413	Arnott, David, Easter Frew, Kippen.
3rd	No. 414	Binnie, W., & Son, Garth House, Denny.
V	No. 416	Livingstone, John, Peel Hill, Strathaven.

CLASS 89. LEGHORN—Any other Colour—Hen or Pullet.

1st	No. 422	Penny, James G., Sauchie Poultry Farm, Crieff (Black).
2nd	No. 423	Ross, J. C., Stirling Road, Larbert (Black).
3rd	No. 419	Clark, George, 453 Cambusnethan Street, Wishaw (Black).
C	No. 420	Glencross, James H., 26 Garry Park, Glencraig, Fife (Black).

CLASS 90. WYANDOTTE—Any Colour—Hen or Pullet.

1st	No. 424	Binnie, W., & Son, Garth House, Denny (White).
2nd	No. 428	Lyle, Lady, Glendelvine, Murthly (White).
3rd	No. 430	Orr, James D., Gargunnock, Stirling (White).
V	No. 426	Harbottle, Mr and Mrs R. P., Albion House, Great Ayton, Yorks. (White).
H	No. 434	Wharton, John, Honeycott Farm, Hawes, Yorks. (White).
C	No. 433	Shewan, Alexander, Longhillock, Alves, Forres (White).

CLASS 91. RHODE ISLAND RED—Hen or Pullet

1st	No. 440	Morgan, William, Balcurvie, Windygates.
2nd	No. 442	Reid, David, Firthview, Portgordon.
3rd	No. 444	Younger, Mrs J., Mount Melville, St Andrews.
V	No. 435	Allan, William, Newcastle, Halbeath, Dunfermline.
H	No. 443	Reid, David, Firthview, Portgordon.
C	No. 436	Allan, William, Newcastle, Halbeath, Dunfermline.

CLASS 92. BARNEVELDER—Hen or Pullet.

1st	No. 446	Morgan, William, Balcurvie, Windygates.
2nd	No. 445	Binnie, W., & Son, Garth House, Denny.
C	No. 447	Williams, A., 127 Westwood Avenue, Kirkcaldy.

CLASS 93. ROCK—Any Colour—Hen or Pullet.

1st	No. 451	Orr, James D., Gargunnock, Stirling (Buff).
2nd	No. 452	Orr, James D., Gargunnock, Stirling (Buff).
3rd	No. 450	Morgan, William, Balcurvie, Windygates (Barred).
C	No. 453	Orr, James D., Gargunnock, Stirling (Barred).

CLASS 94. WELSUMMER—Hen or Pullet.

1st	No. 458	Orr, James D., Gargunnock, Stirling.
2nd	No. 456	Orr, James D., Gargunnock, Stirling.
3rd	No. 457	Orr, James D., Gargunnock, Stirling.
C	No. 455	Morgan, William, Balcurvie, Windygates.

CLASS 95. ANY OTHER VARIETY—Hen or Pullet

1st No 460 Binnie, W , & Son, Garth House, Denny (Minorca)
2nd No 463 Harbottle, Mr and Mrs R P , Albion House, Great Ayton, Yorks (Light Sussex)
3rd No 459 Beveridge, John, 24 North Square, Wellwood, Dunfermline (Australorp).
V No 465 Macduff-Duncan, H , Lennoch Poultry Farm, Comrie (Light Sussex)
H No 468 Miller, Robert C , & Son, Boghead, Dumbarton (Minorca)
C No 469 Morgan, William, Balcurvie, Windygates (Light Sussex)

CLASS 96. ANY CROSS FOR LAYING PURPOSES—Hen

1st No. 476 Morgan, William, Balcurvie, Windygates
2nd No. 474 Dickson, John H , Howlet's Ha', Gordon, Berwickshire
3rd No. 479 Ross, J C , Stirling Road, Larbert
V No 475 Marshall, Andrew, Airth, Falkirk

CLASS 97. ANY CROSS FOR LAYING PURPOSES—Pullet

1st No 482 Orr, James D , Gargunnock, Stirling
2nd No 481 Orr, James D , Gargunnock, Stirling
C No 480 Dickson, John H , Howlet's Ha', Gordon, Berwickshire.

CLASS 98. DUCKS—Aylesbury—Drake

1st No 483 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream
2nd No. 484 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream

CLASS 99. DUCKS—Aylesbury—Duck.

1st No 485 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream
2nd No. 486 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream
3rd No 488 M'Laren, Duncan R , Inch, Kincardine, Alloa
V No 487 M'Laren, Duncan R , Inch, Kincardine, Alloa.

CLASS 100. DUCKS—Aylesbury—Drake (Young).

1st No. 489 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream
2nd No. 490 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

CLASS 101. DUCKS—Aylesbury—Duck (Young)

1st No 491 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream
2nd No. 492 Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

CLASS 102. DUCKS—Orpington—Drake.

1st No 495	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.
2nd No 494	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

CLASS 103. DUCKS—Orpington—Duck.

1st No. 498	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.
2nd No. 497	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

CLASS 104. DUCKS—Orpington—Drake (Young).

1st No. 500	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.
2nd No. 501	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

CLASS 105. DUCKS—Orpington—Duck (Young).

1st No. 503	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.
2nd No. 504	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.

CLASS 106. DUCKS—Indian Runner—Drake.

(No Entry.)

CLASS 107. DUCKS—Indian Runner—Duck.

1st No. 505	Shewan, Alexander, Longhillock, Alves, Forres.

CLASS 108. DUCKS—Any other Variety—Drake.

1st No. 508	M'Pherson, R., Drumboy, Strathaven (Rouen).
2nd No. 507	Kirkwood, R. A., Camelon Hotel, Falkirk (Rouen).
3rd No. 509	Turnbull, W. B., Allanbank Mill, Chirnside (Muscovy).

CLASS 109. DUCKS—Any other Variety—Duck.

1st No. 512	M'Pherson, R., Drumboy, Strathaven (Rouen).
2nd No. 511	Kirkwood, R. A., Camelon Hotel, Falkirk (Rouen).
3rd No. 513	Turnbull, W. B., Allanbank Mill, Chirnside (Muscovy).

CLASS 110. GEESE—Gander.

1st No. 515	Rottenburg, F. A., of Lochlane, Crieff.
2nd No. 516	Shewan, Alexander, Longhillock, Alves, Forres.

CLASS 111. GEESE—Goose.

1st	No. 518	Rottenburg, F. A., of Lochlane, Crieff.
2nd	No. 519	Shewan, Alexander, Longhillock, Alves, Forres.

CLASS 112. TURKEYS—Cock.

1st	No. 520	Andrew, Mrs J., South Tulloford, Oldmeldrum.
2nd	No. 521	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream.
3rd	No. 523	Rottenburg, F. A., of Lochlane, Crieff.
V	No. 524	Rottenburg, F. A., of Lochlane, Crieff.
H	No. 522	Laurie, Mrs, Kettlestoun Mains, Linlithgow.

CLASS 113. TURKEYS—Hen.

1st	No. 527	Laurie, Mrs, Kettlestoun Mains, Linlithgow.
2nd	No. 529	Rottenburg, F. A., of Lochlane, Crieff.
3rd	No. 528	Rottenburg, F. A , of Lochlane, Crieff.
V	No. 525	Andrew, Mrs J., South Tulloford, Oldmeldrum.

TABLE POULTRY.

CLASS 114. ANY PURE BREED—Cock.

1st	No. 534	Kirkwood, R. A., Camelon Hotel, Falkirk (Indian Game).
2nd	No. 533	Greenhow & Hartley, Galaberry Poultry Farm, Annan (Sussex, White).
3rd	No. 531	Binnie, W., & Son, Garth House, Denny (Wyandotte, White).
V	No. 532	Black, William A. P., Croftfoot, Old Polmont (Indian Game).
H	No. 535	Macduff-Duncan, H., Lennoch Poultry Farm, Comrie (Indian Game).

CLASS 115. ANY PURE BREED—Cockerel.

1st	No. 538	Macduff-Duncan, H., Lennoch Poultry Farm, Comrie (Indian Game).
2nd	No. 536	Binnie, W., & Son, Garth House, Denny (Wyandotte, White).
3rd	No. 537	Black, William A. P., Croftfoot, Old Polmont (Indian Game).
V	No. 539	Penny, James G., Sauchie Poultry Farm, Crieff (Indian Game).

CLASS 116. ANY CROSS—Cock.

1st	No. 540	Black, William A. P., Croftfoot, Old Polmont (Game Cross).
2nd	No. 542	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream (Sussex—Game).
3rd	No. 543	Oswald, Mrs, Dunnikier, Kirkcaldy (Sussex—Game).
V	No. 541	Black, William A. P., Croftfoot, Old Polmont (Game Cross).

CLASS 117. ANY CROSS—Cockerel.

1st	No. 545	Huntly, James, & Son, Hirsel Poultry Farm, Coldstream (Sussex—Game).
2nd	No. 547	Oswald, Mrs, Dunnikier, Kirkcaldy (Sussex—Game).
3rd	No. 544	Black, William A. P., Croftfoot, Old Polmont (Game Cross).
V	No. 548	Penny, James G., Sauchie Poultry Farm, Crieff (Sussex—Game).
H	No. 546	Macduff-Duncan, H., Lennoch Poultry Farm, Comrie (Sussex—Game).

CLASS 118. ANY PURE BREED OR CROSS—Pair of Pullets.

1st	No. 550	Greenhow & Hartley, Galaberry Poultry Farm, Annan (Sussex, White).
2nd	No. 549	Black, William A. P., Croftfoot, Old Polmont (Indian Game).

DAIRY PRODUCE

CLASS 1. POWDERED BUTTER, not less than 3 lb.—PREMIUMS, £4, £3, £2, and £1.

1st	No. 4	Monteith, Mrs H., The Island, Bothkennar, Falkirk.
2nd	No. 6	Ramage, Mrs J., Lathallan Dairy, Polmont, Falkirk.
3rd	No. 1	Braes, Miss J. M., Woodhead Farm, Newmills, Fife.
4th	No. 8	Shanks, Miss, Broomhill, Denny.
V	No. 3	M'Kerrow, Mrs, Nenthorn Dairy, Kelso.
H	No. 10	Young, William, Dalmoak, Dumbarton.
C	No. 7	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder.

CLASS 2. FRESH BUTTER, three 1-lb. lots, to be made up in form of bricks.—PREMIUMS, £4, £3, £2, and £1.

1st	No. 15	Monteith, Mrs H., The Island, Bothkennar, Falkirk.
2nd	No. 19	Shanks, Miss, Broomhill, Denny.
3rd	No. 21	Young, William, Dalmoak, Dumbarton.
4th	No. 13	MacGregor, Miss Margaret, South Bellyeoman Farm, Dunfermline.
V	No. 16	Mundell, Miss Margaret, Dalilongart, Sandbank, Argyll.
H	No. 12	Fleming, Ian, Camquhart, Glendaruel, Argyll.
C	No. 17	Ramage, Mrs J., Lathallan Dairy, Polmont, Falkirk.

CLASS 3. CHEDDAR CHEESE, 56 lb. and upwards.—PREMIUMS, £9, £5, £3, £2, and £1.

1st	No. 22	M'Dowall, George, South Boreland, Dunragit.
2nd	No. 23	M'Minn, Samuel, Torrs Dairy, Kirkcudbright.
3rd	No. 27	Smith, John, Upper Torrs, Castle Douglas.
4th	No. 25	Paterson, Joseph, Dromore Dairy, Kirkcudbright.
5th	No. 24	Milroy, James, Chapelton Dairy, Borgue, Kirkcudbright.
H	No. 26	Simpson, William, Machermore Mains Dairy, Newton-Stewart.

CLASS 4. CHEESE, 14 lb. and under.—PREMIUMS, £5, £3, £2, and £1.

1st	No. 28	M'Dowall, George, South Boreland, Dunragit.
2nd	No. 30	Paterson, Joseph, Dromore Dairy, Kirkcudbright.
3rd	No. 31	Roberts, Sir James Denby, Bt., Strathallan Castle, Auchterarder.
4th	No. 29	M'Minn, Samuel, Torrs Dairy, Kirkcudbright.
H	No. 33	Smith, John, Upper Torrs, Castle Douglas.
C	No. 32	Simpson, William, Machermore Mains Dairy, Newton-Stewart.

HONEY, &c.

OPEN CLASSES.

Silver Cup or Tazza. Presented by the late Mr R. Y. Howie, Rutherglen. *To be competed for annually at the Highland and Agricultural Society's Show, and awarded to the competitor gaining most points in the Classes for Honey and Wax only, calculated on the following basis: 1st Prize, 3 points; 2nd Prize, 2 points; 3rd Prize, 1 point. In the event of a tie, the competitor having most First Prizes to be adjudged the winner.*

Duguid, Robert, Victoria Apiary, Cornhill, Banffshire (21 points).

Silver and Bronze Medals will be awarded by the Scottish Bee-Keepers' Association *to the First and Second winners of the greatest number of points in the Classes for Honey and Wax only, calculated on the following basis: 1st Prize, 3 points; 2nd Prize, 2 points; 3rd Prize, 1 point.*

Silver Medal—Duguid, Robert, Victoria Apiary, Cornhill, Banffshire (21 points).

Bronze Medal—Scott, George, Waterton, Cumnock (11 points).

CLASS 1. Collection of APPLIANCES suitable for a beginner's outfit for Bee-keeping. A card naming all the articles, along with the price at which they will be supplied for one year from date, to be fixed to the exhibit.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 2	Young, R. & J., Wellington Place, Dunoon.
2nd	No. 1	Steele, R., & Brodie, Bee Appliance Works, Wormit, Fife.

CLASS 2. Best and most complete FRAME HIVE for general use, with any improvements. Unpainted.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 5	Steele, R., & Brodie, Bee Appliance Works, Wormit, Fife.
2nd	No. 6	Young, R. & J., Wellington Place, Dunoon.
3rd	No. 3	Scottish Beehives, Ltd., 18 Mill Street, Perth.
H	No. 4	Steele, R., & Brodie, Bee Appliance Works, Wormit, Fife.

CLASS 3. Best and most complete HIVE. Unpainted. Price not to exceed 35s.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 9	Young, R. & J., Wellington Place, Dunoon.
2nd	No. 7	Jamieson, Francis L., 15 Balvie Avenue, Drumchapel, Glasgow.
3rd	No. 8	Steele, R., & Brodie, Bee Appliance Works, Wormit, Fife.

CLASS 4. Six Sections of COMB HONEY, excluding Heather Honey.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 16	Wilson, A., West Lodge, Montgomerie, Mauchline.
2nd	No. 15	Rutherford, F. J., Flodden Cottage, Cornhill-on-Tweed.
3rd	No. 10	Allan, George C., 7 Springvale Road, Ayr.
V	No. 11	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.

CLASS 5. Six Sections of HEATHER HONEY.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 21	Rutherford, F. J., Flodden Cottage, Cornhill-on-Tweed.
2nd	No. 19	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire
3rd	No. 20	Pate, Thomas, Hopefield, Milnathort.
V	No. 18	Anderson, Gordon, Home Farm, Mayne, Elgin.

CLASS 6. Six Jars of RUN or EXTRACTED LIGHT-COLOURED HONEY, approximate weight 6 lb.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 24	Edmondson, R., Rothay, Hale Road, Ringway, Altrincham
2nd	No. 28	Scott, George, Waterton, Cumnock.
3rd	No. 26	Keay, Mrs M. F., Champions, Beaminster, Dorset.
V	No. 27	Rutherford, F. J., Flodden Cottage, Cornhill-on-Tweed.
H	No. 22	Allan, George C., 7 Springvale Road, Ayr.

CLASS 7. Six Jars of RUN or EXTRACTED MEDIUM or DARK-COLOURED HONEY, excluding Heather Honey, approximate weight 6 lb.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 37	Scott, George, Waterton, Cumnock.
2nd	No. 38	Smith, W. Wilson, 71 High Street, Innerleithen.
3rd	No. 36	Rutherford, F. J., Flodden Cottage, Cornhill-on-Tweed.
V	No. 34	Jackson, John, Tarlair, Thornhill, Dumfriesshire.
H	No. 29	Allan, George C., 7 Springvale Road, Ayr.
C	No. 35	Park, David C., Setonhill, Longniddry.

CLASS 8. Six Jars of PRESSED HEATHER HONEY in liquid form, approximate weight 6 lb.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 47	Rutherford, F. J., Flodden Cottage, Cornhill-on-Tweed.
2nd	No. 40	Anderson, Gordon, Home Farm, Mayne, Elgin.
3rd	No. 42	Edmondson, R., Rothay, Hale Road, Ringway, Altrincham.
V	No. 48	Scott, George, Waterton, Cumnock
H	No. 45	Jackson, John, Tarlair, Thornhill, Dumfriesshire.

CLASS 9. Six Jars of GRANULATED HONEY, approximate weight 6 lb.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 55	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
2nd	No. 53	Anderson, Gordon, Home Farm, Mayne, Elgin.
3rd	No. 54	Duffton, Robert, Macdonald Street, Huntly

CLASS 10. Two shallow Frames of COMB HONEY for extracting purposes.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 60	Rodger, Joseph C., Milton, Auchterarder.
2nd	No. 58	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.

CLASS 11. Best display of HONEY in any form suitable for a shop window in space 4 feet by 4 feet. Weight of honey not to exceed 40 lb.—PREMIUMS, 60s., 30s., and 20s.

1st	No. 62	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
2nd	No. 63	Smith, W. Wilson, 71 High Street, Innerleithen.

CLASS 12. Best exhibit of not less than 1 lb. of WAX in any form.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 64	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
2nd	No. 68	Thomson, Miss Meg, 4 Burn Street, Dalbeattie.
3rd	No. 65	Jackson, John, Tarlair, Thornhill, Dumfriesshire.
V	No. 67	Rutherford, F. J., Flodden Cottage, Cornhill-on-Tweed.
H	No. 66	Park, David C., Setonhill, Longniddry.

CLASS 13. Best exhibit of not less than 1 lb. of WAX made into shapes for retail trade and over-counter trade. Convenience in packing to be taken into consideration.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 70	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
2nd	No. 71	Park, David C., Setonhill, Longniddry.
3rd	No. 69	Allan, George C., 7 Springvale Road, Ayr.
V	No. 73	Wilson, Miss Margaret, St Margaret's, Tillicoultry.

CLASS 14. OBSERVATORY HIVE, with Queen and Bees—two or more frames.—PREMIUMS, 50s., 30s., and 20s.

1st	No. 75	Birrell, James, 24 King Street, Perth.
2nd	No. 76	Porter, Andrew, Cleddans Stables, Airdrie.
3rd	No. 77	Smith, W. Wilson, 71 High Street, Innerleithen.
V	No. 78	Stark, John, 42 Main Street, Calderbank, Airdrie.

CLASS 15. OBSERVATORY HIVE, with Queen and Bees—one frame, no super.—PREMIUMS, 40s., 30s., and 15s.

1st	No. 83	Stark, John, 42 Main Street, Calderbank, Airdrie.
2nd	No. 80	Birrell, James, 24 King Street, Perth.
3rd	No. 81	Porter, Andrew, Cleddans Stables, Airdrie.
V	No. 82	Smith, W. Wilson, 71 High Street, Innerleithen.
C	No. 84	Wilson, Miss Margaret, St Margaret's, Tillicoultry.

CONFINED TO SCOTTISH EXHIBITORS.

CLASS 16. One Standard Frame of COMB HONEY for extracting purposes.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 87	Park, David C., Setonhill, Longniddry.
2nd	No. 85	Allan, George C., 7 Springvale Road, Ayr.
3rd	No. 86	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.

CLASS 17. Six Sections of COMB HONEY, excluding Heather Honey.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 94	Scott, George, Waterton, Cumnock.
2nd	No. 96	Wilson, A., West Lodge, Montgomerie, Mauchline.
3rd	No. 90	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
V	No. 88	Allan, George C., 7 Springvale Road, Ayr.
H	No. 89	Anderson, Gordon, Home Farm, Mayne, Elgin.
C	No. 93	Park, David C., Setonhill, Longniddry.

CLASS 18. Six Sections of HEATHER HONEY.—PREMIUMS, 30s., 20s., and 10s.

1st	No. 99	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
2nd	No. 101	Pate, Thomas, Hopefield, Milnathort.
3rd	No. 100	Henderson, Miss Mary, St Leonard's Smithy, Dunfermline.
V	No. 103	Smith, W. Wilson, 71 High Street, Innerleithen.
H	No. 97	Allan, George C., 7 Springvale Road, Ayr.

CLASS 19. Six Jars of RUN or EXTRACTED MEDIUM or DARK-COLOURED HONEY, excluding Heather Honey, approximate weight 6 lb.—PREMIUMS, 30s., 20s., and 10s.

1st	No. 112	Scott, George, Waterton, Cumnock.
2nd	No. 113	Smith, W. Wilson, 71 High Street, Innerleithen.
3rd	No. 108	Jackson, John, Tarlair, Thornhill, Dumfriesshire.
V	No. 104	Allan, George C., 7 Springvale Road, Ayr.
H	No. 106	Duguid, Robert, Victoria Apiary, Cornhill, Banffshire.
C	No. 110	Park, David C., Setonhill, Longniddry.

CLASS 20. Six Jars of PRESSED HEATHER HONEY in liquid form, approximate weight 6 lb.—PREMIUMS, 20s., 15s., and 10s.

1st	No. 125	Thoms, A. R. B., Springbank, George Street, Coupar-Angus.
2nd	No. 122	Renton, James G., Duneatonview, Crawfordjohn, Lanarkshire.
3rd	No. 126	Thoms, John, 37 Lintrose, Coupar-Angus.
V	No. 120	Jackson, John, Tarlair, Thornhill, Dumfriesshire.
H	No. 124	Scott, George, Waterton, Cumnock.

CLASS 21. Six Jars of RUN or EXTRACTED LIGHT-COLOURED HONEY, approximate weight 6 lb.—PREMIUMS, 30s., 20s., and 10s.

1st	No. 129	Duffton, Robert, Macdonald Street, Huntly.
2nd	No. 131	Jackson, John, Tarlair, Thornhill, Dumfriesshire.
3rd	No. 132	Macdonald, D. G., Kinloch Gardens, Collessie, Fife.
V	No. 127	Allan, George C., 7 Springvale Road, Ayr.
H	No. 134	Scott, George, Waterton, Cumnock.
C	No. 135	Thomson, Miss Meg, 4 Burn Street, Dalbeattie.
C	No. 136	Wilson, A., West Lodge, Montgomerie, Mauchline.

RURAL INDUSTRIES

OPEN CLASSES.

SHETLAND KNITTING.

(*Exhibits made from Shetland Wool.*)

CLASS 1. FINE LACE SHAWL or SCARF.— PREMIUMS, £3, £2, and £1.

1st	No. 13	Peterson, Mrs M. J., Muness, Uyeasound, Lerwick (Scarf).
2nd	No. 18	Sutherland, Miss Julia F., 10 Chromate Lane, Lerwick (Scarf)
3rd	No. 7	Hunter, Mrs J. J., Clivocast, Uyeasound, Lerwick (Shawl).
V	No. 6	Hunter, Mrs, Muness, Uyeasound, Lerwick (Scarf).
H	No. 4	Cluness, Mrs A. T., Muness, Uyeasound, Lerwick (Scarf).
C	No. 8	Jamieson, Miss B., Gritquoy, Uyeasound, Lerwick (Scarf).

CLASS 2. FINE LACE GOODS OTHER THAN ABOVE.— PREMIUMS, £3, £2, and £1.

1st	No. 25	Gilbertson, Mrs C., Muness, Uyeasound, Lerwick (Jumper).
2nd	No. 36	Williamson, Miss Annie, Ronan, Uyeasound, Lerwick (Blouse).
3rd	No. 23	Cluness, Mrs A. T., Muness, Uyeasound, Lerwick (Jumper).
V	No. 28	Hughson, Mrs J. H., Dandies, Uyeasound, Lerwick (Jumper).
H	No. 31	Laurenson, Mrs A., Seaview House, Lerwick (Baby's Dress).
C	No. 29	Inkster, Mrs James J., Gardie, Uyeasound, Lerwick (Jumper).

CLASS 3. JUMPER or CARDIGAN—with or without Sleeves.— PREMIUMS, £3, £2, and £1.

1st	No. 43	Gardner, Miss Joan, Houll, Fetlar, Shetland (Jumper).
2nd	No. 48	Jacobson, Miss Joey, Stonydale, Bridge of Walls, Shetland (Cardigan).
3rd	No. 52	Johnston, Miss Margaret A., West Houlland, Bridge of Walls, Shetland (Jumper).
V	No. 47	Jacobson, Miss Cara V., Stonydale, Bridge of Walls, Shetland (Jumper).
H	No. 61	Sinclair, Miss Mattie, Swinister, Sandwick, Lerwick (Jumper).
C	No. 39	Brown, Miss Mary, Weathersta, Brae, Shetland (Cardigan).

CLASS 4. EXHIBITS OTHER THAN ABOVE.— PREMIUMS, £2, £1, and 10s.

1st	No. 71	Dalziel, Miss Agnes, 67a Commercial Road, Lerwick (Dressing Gown).
2nd	No. 74	Moncrieff, Miss Eliza, Beachend, North Roe, Shetland (Shawl).
3rd	No. 83	Williamson, Miss Annie, Ronan, Uyeasound, Lerwick (Dressing Wrap).
V	No. 84	Williamson, Miss J., Ronan, Uyeasound, Lerwick (Petticoat).
H	No. 79	Smith, Miss Ruby A., Scattlands, West Sandwick, Lerwick (Shawl).
C	No. 69	Brown, Miss M. J., Kingland, Ollaberry, Shetland (Shawl).
C	No. 70	Cooper, Miss M., Hammers, Voe, Lerwick (Shawl).

TWEEDS.

CLASS 5. HARRIS or OTHER TWEED—Hand-woven.—
PREMIUMS, £3, £2, and £1.

1st	No. 91	Johnson, James, Gateside, Levenwick, Lerwick.
2nd	No. 89	Hogg, David, 10 High Street, Earlston, Berwickshire.
3rd	No. 86	Borland, James, Esplanade, Stornoway, Isle of Lewis.
V	No. 88	Borland, James, Esplanade, Stornoway, Isle of Lewis.
H	No. 87	Borland, James, Esplanade, Stornoway, Isle of Lewis.
C	No. 96	MacPhail, Miss Margaret, Minch View, Locheport, North Uist.
C	No. 98	Ross, William, Lairg.

CLASS 6. TARTAN—Vegetable-dyed and Hand-woven.—
PREMIUMS, £3, £2, and £1.

1st	No. 105	Ross, Mrs D. S., Lairg.
2nd	No. 100	MacGregor, Robert, Paton Street, Inverness.
3rd	No. 99	MacGregor, Robert, Paton Street, Inverness.
V	No. 106	Ross, William, Lairg.
H	No. 101	Matheson, Mrs Farquhar, Tigh-an-stor, Arisaig, Inverness-shire.
C	No. 102	Murray, Miss Margaret, Tressidy Hill, Lairg.

CLASS 7. CARRIAGE RUG or PLAID—Hand-woven.—
PREMIUMS, £3, £2, and £1.

1st	No. 109	MacGregor, Robert, Paton Street, Inverness.
2nd	No. 111	Murray, Miss Margaret, Tressidy Hill, Lairg.
3rd	No. 112	Ross, Mrs D. S., Lairg.
V	No. 108	MacGregor, Robert, Paton Street, Inverness.
H	No. 110	Murray, Miss Margaret, Tressidy Hill, Lairg.
C	No. 113	Sutherland, Miss Susan, Mid Brae, Brae, Lerwick.

MISCELLANEOUS.

CLASS 8. HOOK-THROUGH FLOOR RUG (New Wool).—
PREMIUMS, £3, £2, and £1.

1st	No. 117	Clark, Mrs, 2 Gray Street, Perth.
2nd	No. 116	Campbell, Mrs N., Poltalloch, Kilmartin, Argyll.
3rd	No. 130	Wilson, Miss A., Muircot, Tillicoultry.
V	No. 124	MacTavish, Miss Mary, Clydesdale Buildings, Lochgilphead, Argyll.
H	No. 122	Macmillan, Miss Mary G., Glencrosh, Moniaive, Dumfries-shire.
C	No. 119	M'Dougall, Andrew, Boreland, Lockerbie.

CLASS 9. ANY OTHER VARIETY FLOOR RUG (New Wool).—
PREMIUMS, £3, £2, and £1.

1st	No. 132	Dunlop, Miss Mary, Craigraploch, Castle Douglas.
2nd	No. 134	Lyal, Miss, Old Greenlaw, Greenlaw, Berwickshire.
3rd	No. 135	MacKean, Mrs, 53 Falcon Road, Edinburgh.
H	No. 138	White, Mrs M. F., Syram, Horsburgh Avenue, Kilsyth.

CLASS 10. SPECIMEN OF WHITE EMBROIDERY—to be exhibited unwashed.—PREMIUMS, £3, £2, and £1.

1st	No. 142	Pringle, Mrs E., Ouston Cottage, Whitfield, Northumberland (Tea Cloth).
2nd	No. 139	English, Mrs E., Middleton, Morpeth, Northumberland (Tea Cloth).
3rd	No. 140	Irving, Mrs, 1 Market Square, Stony Stratford, Bucks. (Duchess Set).
H	No. 143	Telfer, Miss I., Ottercaps, Kirkwhelpington, Newcastle-on-Tyne (Duchess Set).

CLASS 11. SPECIMEN OF COLOURED EMBROIDERY—Silk or Cotton. (Canvas work not eligible.)—PREMIUMS, £3, £2, and £1.

1st	No. 164	M'Leod, Miss M. A., Leven House, Milnathort, Kinross-shire (Fire Screen).
2nd	No. 151	English, Mrs E., Middleton, Morpeth, Northumberland (Fire Screen).
3rd	No. 173	Ritchie, Mrs, Strathdean, Leckaway, Forfar (Tea Cloth).
V	No. 172	Reid, Miss G., Enfield, Symington, Biggar (Panel).
H	No. 170	Pringle, Mrs E., Ouston Cottage, Whitfield, Northumberland (Table Runner).
C	No. 152	Fleming, Mrs James, Well View, Moffat (Cushion).
C	No. 154	Galt, Miss Greta M., Waukmill, Barrhill, Girvan, Ayrshire (Tea Cloth).
C	No. 161	Kinloch Rannoch W.R.I., Pitlochry (Quilt).
C	No. 174	Seton, Miss Bessie A., 16 Crofthead Road, Prestwick, Ayrshire (Cushion).

CLASS 12. SPECIMEN OF COLOURED EMBROIDERY—Woolwork. (Canvas work not eligible.)—PREMIUMS, £3, £2, and £1.

1st	No. 191	Pithie, Miss M., 21 Henry Street, Langholm, Dumfriesshire (Fire Screen).
2nd	No. 186	Gibson, Miss J. D., Heavyside, Biggar (Panel).
3rd	No. 192	Reid, Miss G., Enfield, Symington, Biggar (Panel).
V	No. 184	Fleming, Mrs James, Well View, Moffat (Square).
H	No. 182	Brown, Mrs A., 8 Glenlee Street, Burnbank, Hamilton (Fenderstool Top).
C	No. 190	Philip, Miss Winnie, Annfield, Kirriemuir (Portiere).

CLASS 13. SPECIMEN OF OLD ENGLISH QUILTING.—PREMIUMS, £3, £2, and £1.

1st	No. 194	Anderson, Mrs C., 13 Slitrig Crescent, Hawick (Bedspread).
2nd	No. 201	Rutherford, Mrs H., West Highridge, Wark-on-Tyne, Northumberland (Quilt).
3rd	No. 195	Elgin, The Countess of, Broomhall, Dunfermline (Quilt).
V	No. 197	Home, Miss E. Logan, Silver Wells, Coldingham, Berwickshire (Cushion).
H	No. 203	Yellowlees, Mrs D. M., Torwoodlea, Larbert (Cot Quilt).
C	No. 199	Macrae, Miss Duncina, Lovedale, Kyle of Lochalsh (Nightdress Sachet).

CLASS 14. PAIR OF LEATHER GLOVES.—PREMIUMS, £2, £1, and 10s.

1st	No. 207	Dunchurch and Thurlaston Women's Institute, Rugby.
2nd	No. 210	Dunchurch and Thurlaston Women's Institute, Rugby.
3rd	No. 204	Dickie, Miss Anne L., 98 Nicol Street, Kirkcaldy.
V	No. 205	Downing, Mrs H. H., Knotwood Farm, Stony Stratford, Bucks.
H	No. 209	Dunchurch and Thurlaston Women's Institute, Rugby.
C	No. 211	Dunchurch and Thurlaston Women's Institute, Rugby.

CLASS 15. SPECIMEN OF LEATHER WORK OTHER THAN GLOVES.—PREMIUMS, £2, £1, and 10s.

1st	No. 213	Bakewell, Mrs E. L., "Fifteen," Greville Road, Warwick (Writing Case).
2nd	No. 214	Bakewell, Mrs E. L., "Fifteen," Greville Road, Warwick (Handbag).
3rd	No. 218	Nodwell, Mrs M. S., 54 Ashburton Road, Glasgow (Handbag).
V	No. 216	Heaps, Mrs J., Lilybank, Ratho Station, Midlothian (Bag).
H	No. 220	Townson, Miss Helen, Heathersett, Bathgate (Handbag).

CLASS 16. SPECIMEN OF HAND-PAINTED POTTERY.—PREMIUMS, £2, £1, and 10s.

1st	No. 223	Henderson, Miss H. S. G., Redburn, Blackridge, Bathgate, West Lothian (Fruit Dish).
2nd	No. 227	Reid, Miss G., Enfield, Symington, Biggar (Jug).
3rd	No. 221	Downey, Miss Mary J., The Whins, Kilrenny, Anstruther, Fife (Plaque).
V	No. 230	Weir, Mrs M. A., Schoolhouse, Blackridge, West Lothian (Bowl).
H	No. 224	Hogg, Miss J. M., Garioch, Weirgate Road, St Boswells (Jug).
C	No. 222	Downey, Miss Mary J., The Whins, Kilrenny, Anstruther, Fife (Plaque).
C	No. 225	Hogg, Miss J. M., Garioch, Weirgate Road, St Boswells (Vase).

CLASS 17. SPECIMEN OF WOODCRAFT. (Small article).—PREMIUMS, £2, £1, and 10s.

2nd	No. 231	Kemp, Miss Margaret M., The Newcomes, Doune, Perthshire (Picture).
3rd	No. 232	M'Leod, Miss M. A., Leven House, Milnathort, Kinross-shire (Piano Stool).
C	No. 233	Younger, Miss Nan, Wester Craigduckie, Dunfermline (Table Lamp).

CLASS 18. HOME-SPUN YARN—2-3 cuts.—PREMIUMS, £2, £1, and 10s.

1st	No. 244	Smith, Miss Dollina, Gunnister, Uyeasound, Lerwick.
2nd	No. 243	Smith, Miss Dollina, Gunnister, Uyeasound, Lerwick.
3rd	No. 241	Murray, Miss Margaret, Tressidy Hill, Lairg.
V	No. 234	Clark, Mrs William, Newgord, Uyeasound, Lerwick.
H	No. 242	Peterson, Mrs M. J., Muness, Uyeasound, Lerwick.
C	No. 235	Clark, Mrs William, Newgord, Uyeasound, Lerwick.
C	No. 236	Cluness, Mrs A. T., Muness, Uyeasound, Lerwick.

CLASS 19. SPECIMEN OF HAND-MADE LACE other than Crochet.—PREMIUMS, £3, £2, and £1.

1st	No. 245	Budge, Mrs A. C., Mount Ceres, Broomieknowe, Lasswade (Lacis).
2nd	No. 247	Chalmers, Miss Jessie C., Aucorn, Bower, Wick (Filet).
3rd	No. 249	M'Callum, Miss Grace, Craiganiver, Strachur, Argyll (Filet).
C	No. 246	Chalmers, Miss Ann I., Viewbank, Maud, Aberdeenshire (Point).

CLASS 20. MEN'S GOLF or KILT HOSE.—PREMIUMS, £2, £1, and 10s.

1st	No. 256	Duff, Mrs E., c/o M'Pherson 20 Park Crescent, Scone, Perthshire.
2nd	No. 274	Stewart, Mrs S., Lime Walk, Rosehaugh, Avoch, Ross-shire.
3rd	No. 270	Melville, Miss A. S., Poltalloch Gardens, Kilmartin, Argyll.
V	No. 262	Gibson, Mrs Fred, Balfunning, Balfron, Stirlingshire.
H	No. 272	Robertson, Mrs, Slockvullen, Kilmartin, Argyll.
C	No. 254	Cation, Mrs, East Lodge, Poltalloch, Kilmartin, Argyll.
C	No. 260	Gibson, Mrs Fred, Balfunning, Balfron, Stirlingshire.

CONFINED CLASSES.

Open to Women's Rural Institutes and Members thereof in the whole of Scotland.

CLASS 21. SPECIMEN OF CANVAS WORK.—PREMIUMS, £3, £2, and £1.

1st	No. 281	Grosset, Miss Ethel G., Glenorchy, Links Road, Leven, Fife (Stool Top).
2nd	No. 280	Fleming, Mrs James, Well View, Moffat (Panel).
3rd	No. 286	Pithie, Miss M., 21 Henry Street, Langholm, Dumfriesshire (Handbag).
V	No. 279	Duncan, Mrs J. A., Parkhill, Arbroath (Sampler).
H	No. 282	Liddell, Mrs K. MacDuff, Union Bank House, Pitlochry (Picture).
C	No. 288	Wallace, Miss E. D., Balgreddan, Kirkcudbright (Square).

CLASS 22. SPECIMEN OF CORDED QUILTING.—PREMIUMS, £3, £2, and £1.

1st	No. 297	Wallace, Miss E. D., Balgreddan, Kirkcudbright (Cushion).
2nd	No. 294	Pithie, Miss M., 21 Henry Street, Langholm, Dumfriesshire (Cushion).
3rd	No. 289	Duncan, Miss Margaret, Angle Park, Northmuir, Kirriemuir (Cushion).
H	No. 291	Johnston, Mrs M., Gogar Mains, Blairlogie, Stirling (Cushion).
C	No. 292	Matheson, Miss Barbara, Tigh-an-stor, Arisaig, Inverness-shire (Dressing Gown).
C	No. 296	Stevenson, Mrs, Blackburn, Lauder (Nightdress Sachet).

CLASS 23. EMBROIDERED TRAYCLOTH AND COSY ON PAD.—Premiums, £2, £1, and 10s.

1st	No. 304	Nicholson, Miss C., Gateside, Saline, Fife.
2nd	No. 298	Douglas, Miss F., Rigghill, Closeburn, Dumfriesshire.
3rd	No. 301	Jamieson, Mrs M. B., Blakehope, Clovenfords, Galashiels.
V	No. 300	Inglis, Miss Mary D., Laurel Bank, Menstrie, Clackmannanshire
H	No. 303	Miller, Miss Marjory, Berfern Farm, Inverkip, Renfrewshire.
C	No. 299	Fleming, Mrs James, Well View, Moffat.

CLASS 24. CHILD'S FROCK (Embroidered or Smocked).—Premiums, £2, £1, and 10s.

1st	No. 311	Grieve, Mrs R., Charlecote, Fort William.
2nd	No. 308	Douglas, Miss F., Rigghill, Closeburn, Dumfriesshire.
3rd	No. 316	Sinclair, Mrs M., Kettletoft, Sanday, Orkney.
V	No. 307	Burns, Miss Elsie, 11 High Street, Kirkcudbright.
H	No. 312	Mackenzie, Mrs, Crathie House, Meigle, Perthshire.
C	No. 314	Mitchell, Mrs, Kinloch, Meigle, Perthshire.
C	No. 315	Seton, Miss Bessie A., 16 Crofthead Road, Prestwick, Ayrshire.

CLASS 25. HAND-WOVEN SCARF.—Premiums, £2, £1, and 10s.

1st	No. 321	Matheson, Mrs Farquhar, Tigh-an-stor, Arisaig, Inverness-shire.
2nd	No. 324	Sutherland, Miss Susan, Mid Brae, Brae, Lerwick.
3rd	No. 318	Jamieson, Mrs I. A., Borough Gates, Aberlady, East Lothian.
V	No. 320	Matheson, Miss Barbara, Tigh-an-stor, Arisaig, Inverness-shire.

CLASS 26. PAIR OF SOCKS, 4-Ply, Plain Knitting.—Premiums, £2, £1, and 10s.

1st	No. 327	Cation, Mrs, East Lodge, Poltalloch, Kilmartin, Argyll.
2nd	No. 347	Pithie, Miss M., 21 Henry Street, Langholm, Dumfriesshire.
3rd	No. 331	Duff, Mrs E., c/o M'Pherson, 20 Park Crescent, Scone, Perthshire.
V	No. 330	Duff, Mrs D., Aitkenhead Cottage, Forest Mill, Alloa.
H	No. 341	Macdonald, Mrs D. G., The Gardens, Kinloch, Collessie, Fife.
C	No. 343	Mays, Miss L., West Lodge, Blairhall, Dunfermline.
C	No. 346	Nicholson, Mrs J., Garage, Ross Priory, Alexandria, Dumbartonshire.

BUTTERMAKING COMPETITIONS

CHAMPIONSHIP CLASS.

Gold Medal.

No. 42 Anderson, Robert, Glencairn, Helensburgh.

Silver Medal.

No. 44 Hudson, Miss Betty, Stobhill Farm, Morpeth.

OPEN CLASS—FIRST SECTION.

PREMIUMS, £5, £3, £2, and £1.

1st	No. 8	White, Miss Marjorie F., 9 Greenhill Place, Edinburgh.
2nd	No. 6	M'Lean, Miss Mona, Croftallan, Nethy Bridge, Inverness-shire.
3rd	No. 10	Youngson, Miss Letta, North Auchronie, Skene, Aberdeenshire.
4th	No. 2	Hewitt, William, 45 Promenade, Musselburgh.
V	No. 1	Buchanan, Miss Jessie, 70 St Meddan's Street, Troon.
H	No. 4	M'Ara, Miss Mary S., Mains of Callander, Crieff.

OPEN CLASS—SECOND SECTION.

PREMIUMS, £5, £3, £2, and £1.

1st	No. 20	Stewart, Miss Margaret L., Lyle Buildings, Kilmacolm.
2nd	No. 19	Russell, Miss Margaret K., Balsier, Sorbie, Wigtownshire.
3rd	No. 14	Dunkeld, Miss Margaret H., Glenae, Brown Street, Motherwell.
4th	No. 12	Arbuckle, Miss Elizabeth D., Lower Luthrie, Cupar, Fife.
V	No. 13	Campbell, Miss Mary, Main Street, Port Charlotte, Isle of Islay.
H	No. 11	Allan, George P., 5 West Argyle Street, Helensburgh.
C	No. 17	Rose, A. W., Sea Point, Cape Town, South Africa.

OPEN CLASS—THIRD SECTION.

PREMIUMS, £5, £3, £2, and £1.

1st	No. 27	Langlands, Miss Molly, 18 Brighton Place, Portobello.
2nd	No. 22	Duncan, Miss Millicent I., Mains of Pittendreigh, Bridge of Marnoch, Huntly.
3rd	No. 29	Mair, Miss Ruby, Glenmore, Oban.
4th	No. 28	MacGregor, Miss Margaret, South Bellyeoman, Dunfermline.
V	No. 21	Crawford, Miss Isabel, Muirhouse Farm, Linlithgow.
H	No. 24	Gall, Miss Christian J. W., Home Farm, Kininmonth, Mintlaw, Aberdeenshire.
C	No. 25	Gibson, Miss Mary, 16 Raikes Parade, Blackpool.

OPEN CLASS—FOURTH SECTION

PREMIUMS, £5, £3, £2, and £1

1st No 39 Steele, Miss Margaret M , Brae of Monzie, Crieff
2nd No 33 MacGregor, Miss Jean B South Bellyeoman, Dunfermline
3rd No 34 Mitchell, Miss Margaret M , The Arms, Clackmannan
4th No 36 Potter, Miss Christina, Crossgreen Farm, Uphall
V No 40 Stewart, Miss Jeanette, Ballathie, Stanley, Perthshire
H No 41 Webster, Mrs A , Milton Farm, Abernyte, Inchture, Perthshire
C No 32 Donaldson, Miss Margaret W , West Mains, Clunie, Murthly

OPEN CLASS—FIFTH SECTION

PREMIUMS, £5, £3 £2, and £1

1st No 49 Stratton, Miss Mary A Littleport, St Fillans, Perthshire.
2nd No 44 Hudson, Miss Betty Stobhill Farm, Morpeth
3rd } equal { No 42 Anderson, Robert, Glencairn, Helensburgh
4th } equal { No 43 Bauchope, Miss Henrietta M G , The Quinloch, Blanefield, Stirlingshire
V No 46 M'Ara, Miss Mitchell Mains of Callander, Crieff
H No 18 Reid, Miss Anne L C , Balmossie, Broughty Ferry
C No 50 Thomson, Miss A Jean, Rosedale, Greba, St Johns, Isle of Man

SHOE-MAKING COMPETITION

Open to Shoeing-Smiths from any part of Great Britain, Northern Ireland, and Irish Free State.

Silver Tea Service, given by the Scottish Iron & Steel Co., Ltd., Glasgow, *to the winner of First Prize.*

Canteen of Cutlery, given by Messrs Neilson & Cleland, Ltd., Coatbridge, *to the winner of Second Prize.*

Gold Medal, given by Mustad Horse Nail Company, *to the winner of Third Prize.*

1st Prize, £5 and Silver Tea Service; 2nd Prize, £4 and Canteen of Cutlery; 3rd Prize, £3 and Gold Medal; 4th Prize, £2; 5th Prize, £1.

1st	No. 19	Duffy, John, Milton Smithy, Glenluce, Wigtownshire.
2nd	No. 11	Redford, Alexander, Jun., Kettins Smithy, Coupar-Angus.
3rd	No. 20	Nicol, William, The Forge, Millbank, Cluny, Tillyfourie, Aberdeenshire.
4th	No. 6	Borthwick, Richard, Mossend Smithy, Gorebridge.
5th	No. 22	Borthwick, James, Mossend Smithy, Gorebridge.
V	No. 35	Young, Matthew L., Polloktown, Newton Mearns, Renfrewshire.
H	No. 36	Fenwick, David P., Balmuir Smithy, Mains, Dundee.
C	No. 10	Gardiner, Robert, Parkview, Balbeggie, Perthshire.
C	No. 12	M'Rae, John, Jun., Knowenack, Kirkmuirhill, Lanark.
C	No. 27	Stephen, Ralph, 19 Victoria Street, Montrose.

HORSE-SHOEING COMPETITION

Open to Shoeing-Smiths from any part of Great Britain, Northern Ireland, and Irish Free State.

Gold Watch, given by Messrs William Martin, Sons, & Co., Coatbridge, *to the winner of First Prize.*

Canteen of Cutlery, given by Messrs Neilson & Cleland, Ltd., Coatbridge, *to the winner of Second Prize.*

Gold Medal, given by National Master Farriers' and Blacksmiths' Association, *to be awarded to the competitor obtaining the highest number of points.*

Gold Medal, given by the Mustad Horse Nail Company, *to the winner of Third Prize.*

Gold Medal, given by Capewell Horse Nail Company, *to the winner of Fourth Prize.*

FARM HORSES—1st Prize, £5, Gold Watch, and Gold Medal; 2nd Prize, £5 and Canteen of Cutlery; 3rd Prize, £5 and Gold Medal; 4th Prize, £4 and Gold Medal; 5th Prize, £3; 6th Prize, £2; 7th Prize, £2; 8th Prize, £1; 9th Prize, £1.

1st	No. 22	Nicol, Alexander, Muir of Breda, Alford, Aberdeenshire.
2nd	No. 37	Blackie, John, Ryslaw Smithy, Duns.
3rd	No. 27	Fenwick, David P., Balmuir Smithy, Mains, Dundee.
4th	No. 15	M'Donald, Ian, Castlehill Smithy, Kintore, Aberdeenshire.
5th	No. 20	Young, Matthew L., Polloktown, Newton Mearns, Renfrewshire.
6th	No. 36	Story, John, Niddrie Mill, Portobello.
7th	No. 24	Ferrie, Thomas C., Ruchazie Smithy, Millerston, Glasgow.
8th	No. 2	Duffy, John, Milton Smithy, Glenluce, Wigtownshire.
9th	No. 9	Jeffrey, Alexander, Preston, Ford, Midlothian.
V	No. 41	Stephen, William, Balmellie Street, Turriff.
H	No. 40	Johnston, William, Pitscottie, Cupar, Fife.
C	No. 3	Nicol, William, The Forge, Millbank, Cluny, Tillyfourie, Aberdeenshire.
C	No. 11	M'Rae, John, Jun., Knowenack, Kirkmuirhill, Lanark.
C	No. 19	Fenton, R., Old Montrose, Montrose.
C	No. 21	Barrie, James, Latrigg, Waterloo Road, Lanark.

LIVE STOCK JUDGING COMPETITION

Open to all persons 18 years and under 28 years of age at the date of the Competition.

‘ Glasgow Herald ’ Challenge Cup, value £50, *awarded each year to the team winning the First Prize in the Team Competition.* Given by Messrs George Outram & Co., Ltd., Glasgow.

Renfrewshire Young Farmers’ Club (Team A), 294 points.

Gold Medals *to the highest individual scorers.* Given by Messrs George Outram & Co., Ltd., Glasgow.

Gilmour, Ian C., Cartsbridge, Clarkston
Park, Alexander, Turningshaw Farm, Johnstone } equal, 68 points.

INDIVIDUAL COMPETITION.

PRIZES, £5, £4, £3, £2, and £1.

1st	equal	Gilmour, Ian C., Cartsbridge, Clarkston	68 points.
2nd		Park, Alexander, Turningshaw Farm, Johnstone	68 ,,
3rd	equal	Wilson, Donald M‘P., Knockglass, Uplawmoor	66 ,,
4th		Gray, Miss Jenny I., Langdales, Greengairs, Airdrie	66 ,,
5th	equal	Slater, Andrew H., Grange, Kirkcudbright	62 ,,
		Blackwood, Hugh, Bankhead Farm, Coatbridge	62 ,,
		Laird, Robert R., Duntiglennan, Duntocher, Glasgow	62 ,,
		Young, Charles, Middleton Farm, Dundee	62 ,,
		Walker, William R., Lochend, Wartle	62 ,,

TEAM COMPETITION.

PRIZES { 1st, £10 and 5 Medium Silver Medals.
2nd, £5 and 10 Medium Bronze Medals.

1st		Renfrewshire Young Farmers’ Club (Team A)	294 points.
2nd	equal	Edinburgh and East of Scotland College of Agriculture	284 ,,
		West Perthshire Young Farmers’ Club (Team B)	284 ,,

Special Prize *for College team placed highest in Competition*—£5.

Edinburgh and East of Scotland College of Agriculture, 284 points.

NEW IMPLEMENTS

The Judges, having inspected the new implements submitted for competition, awarded Silver Medals to—

E. H Bentall & Co, Heybridge, Maldon, Essex—" Kent " Root Gapper (No 696)
W. Henderson & Sons, 330 Kelvindale Road, Glasgow, C 2—" Collins " Anti-Slip Wheel Device (No 516).
Alexander Jack & Sons, Ltd., Maybole—Three-Row Combined Drill Plough, Artificial Manure Distributor, and Dibbler or Spacer (No 969).

JUDGES.

Shorthorn — Finlay MacGillivray, Aldie, Tain; John Wallace, Anticur, Dunloy, Co. Antrim.

Aberdeen-Angus—George Abel, East Leylodge, Kintore; William J. Reid, Fordhouse of Dun, Montrose.

Galloway—J. Faed Sproat, Boreland of Anwoth, Gatehouse of Fleet.

Belted Galloway—Peter Gordon, Balcraig Moor, Port William.

Highland Cattle—M. G. M'Diarmid of Finnart, Rannoch Station.

Ayrshire — Alexander Cochrane, Nether Craig, Kilmarnock; Hugh Howie, Finnockbog, Inverkip.

British Friesian—John Craig, Green Farm, Linwood, Paisley; Robert Wallace, Cherry Tree Hall, Datchworth, Knebworth.

Clydesdale Stallions and Colts—George Argo, Petty, Fyvie; John M'K. M'Farlane, Bailielands, Auchterarder.

Clydesdale Geldings—James Gray, West Newhall, Kingsbarns.

Clydesdale Mares and Fillies—Alexander Clark, Strathore House, Thornton; James Crawford, Fallgates, Newton-on-Ouse.

Hunters — Fred Porter, Cocklaw, Cockburnspath.

Riding Ponies—Fred Porter, Cocklaw, Cockburnspath.

Highland and Western Island Ponies—John M. Macdonald, Glenbrittle, Wonersh Park, Wonersh, Guildford, Surrey.

Shetland Ponies—Douglas D. Murray, The Dene, Seaham Harbour.

Hackneys in Harness—Robert H. M'Coll, 9 Sherbrooke Avenue, Pollokshields, Glasgow, S.1.

Draught Geldings in Harness—James Gray, West Newhall, Kingsbarns.

Blackface—James Mitchell, Henderland, Selkirk; John Struthers, Anston, Dunsyre, Carnwath.

Cheviot—Simon Dodd, Catcleuch, Otterburn; James B. H. Young, Congeith, Kirkgunzeon, Dumfries.

Border Leicester—Charles H. Dickie, Wooperton, Wooler; James L. Whyte, Hayston, Glamis.

Half-Bred—Thomas A. Sproat, Brighouse, Kirkcudbright.

Oxford Down—John M. Eady, Lancefield, Broughton, Kettering.

Suffolk—H. Groom, Northgate Hall, Warham, Wells, Norfolk.

Goats—T. W. Palmer, 10 Lloyd's Avenue, London, E.C.3.

Large White—Alfred Lewis, Panworth Hall, Ashill, Thetford, Norfolk.

Large Black—F. W. Gilbert, The Manor, Chellaston, Derby.

Poultry—H. Inman, 12 Squire Lane, Girlington, Bradford—Classes 1 to 16, 55 to 81; W. W. Broomhead, Southbridge House, Southbridge, Streatley—Classes 17 to 34, 98 to 118; P. D. Nairn, Hillcrest, St Ninians, Stirling—Classes 35 to 54, 82 to 97.

Dairy Produce — Mrs Prentice, Craigrie Farm, Clackmannan.

Honey, &c.—David Emslie, 42 Moss Street, Elgin.

Rural Industries—Miss Bruce, 111A George Street, Edinburgh—Classes 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 19, 20, 25, 26; Miss C. G. Peacock, 93 West George Street, Glasgow, C.2—Classes 10, 11, 12, 13, 21, 22, 23, 24; Henry G. Paterson, 12 Dryden Place, Edinburgh—Classes 14, 15, 16, 17.

Buttermaking—Alastair A. M. Fisher, St Cuthbert's Co-operative Wholesale Society, Ltd., Edinburgh—Open Sections; William Smith, Naldera, Hailes Gardens, Colinton—Championship.

Horse-shoeing and Shoe-making—George C. Inglis, M.R.C.V.S., 12 Bedford Place, Alloa; James Hall, Halfway House, Paisley Road, Glasgow; John Telfer, Horsemarket Close, Hawick.

STEWARDS.

Cattle.—James Durno, Crichie, Inverurie.

Horses.—George Grant of Glenfarclas, Blacksboat.

Sheep, Goats and Pigs. — James M'Laren, Cornton, Bridge of Allan.

Poultry.—James R. Lumsden of Arden, Dumbartonshire.

Forage.—John W. Prentice, Craigrie Farm, Clackmannan.

Implements. — J. P. Ross - Taylor, Mungoswalls, Duns.

Flower Show.—A. A. Hagart Speirs of Elderslie, Houston House, Renfrewshire.

Special Events.—Alexander Murdoch, East Hallside, Cambuslang.

Grand Stands.—Major Robert W. Sharpe of The Park, Earlston.

Gates.—Ian M. Campbell, Bal Blair, Invershin.

Catering, Bees, Honey, &c.—John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.

ASSISTANT STEWARDS.

Cattle.—J. E. Kerr of Harviestoun, Dollar.

Horses.—John P. Sleigh of St John's Wells, Fyvie.

Sheep, Goats and Pigs. — John Hewetson, Baltersan, Newton Stewart.

Forage.—T. Mercer Sharp, Bardrill, Blackford.

Implements.—James Paton, Kirkness, Glencraig.

Special Events. — Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh.

Grand Stands.—Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Gates.—Alexander Forbes, Reitie, Banff; James Wither, Awhirk, Stranraer.

ATTENDING MEMBERS.

Shorthorn.—*Colonel Robert W. Walker*, *William I. Elliot*, Robert Moubray, John T. M'Laren, Jun.

Aberdeen-Angus.—*James Paton*, *John D. Allan*, James Stirling, Andrew M'Laren, P. S. Anderson.

Galloway.—*John Hewetson*, *G. Bertram Shields*, John Dempster, James Smith.

Belted Galloway.—*Thomas Clark*, *Lieut.-Colonel Garden Beauchamp Duff*, Miss Catherine E. Aitkenhead.

Highland Cattle.—*William Montgomery*, *Captain Ian S. Robertson*, John Monteath, Duncan Cameron.

Ayrshire. — *Thomas Templeton*, *W. P. Gilmour*, John M'Queen, Robert Howie, Matthew Howie.

British Friesian.—*Captain Thomas Elliot*, *A. Y. Allan*, Bailie Daniel Wallace, Andrew J. Heggie, Donald M'Laren.

Clydesdale Stallions and Colts. —*Major R. F. Brebner*, *Charles W. Ralston*, Samuel Young, James M'Laren, Jun., Alexander Christie.

Clydesdale Geldings.—*Alexander Murdoch*, *Walter A. Aitkenhead*, John Finlayson, Andrew Russell.

Clydesdale Mares and Fillies.—*James Wyllie*, *Peter Robertson*, James Logan, Walter A. Aitkenhead, Jun., James Weir.

Hunters.—*Colonel F. J. Carruthers*, *Major Robert W. Sharpe*, *William M'Nair Snadden*, Lieut.-Colonel Archibald Stirling, Captain William J. Stirling, George F. Piggott.

Riding Ponies.—*The Earl of Home, K.T.*, *Major Robert W. Sharpe*, Lieut.-Colonel Archibald Stirling, Captain William J. Stirling, George F. Piggott.

Highland and Western Island Ponies.—*J. M. Kerr*, *Lord Rowallan*, Major C. Falconer-Stewart, M.C., Bailie Daniel M'Kinlay.

Shetland Ponies.—*William Brown*, James Risk, John King.

Hackneys in Harness.—*Sir Hector D. Mackenzie, Bart.*, *Thomas Clark*, Edward H. Macfarlane.

Draught Geldings in Harness.—*Alexander Murdoch*, *Walter A. Aitkenhead*, John Finlayson, Andrew Russell.

Blackface.—*The Master of Polwarth*, Parlan Macfarlan, Robert Lennox, John Paterson, Jack Riddick.

Cheviot.—*Captain James Craig*, *Francis W. Walker*, Donald R. M'Intyre, Donald M'Dougall.

Border Leicester. — *Major S. Strang Steel*, *Duncan M. Stewart*, William Drysdale, William M'Laren, Jun., Captain Campbell Willison.

Half-Bred.—*William Meiklem*, John J. Thomson.

Oxford Down.—*T. Mercer Sharp*, Henry G. M'Farlane.

Suffolk.—*William M'Laren*, D. Y. Stewart, Lawrance D. M'Laren.

Goats.—*Andrew Telfer*, Bailie Peter Fraser.

Large White.—*Thomas M'Lay*, John Fisher, Jun., Dean of Guild Stanton.

Large Black.—*Gavin Ralston*, James Watson.

Poultry.—*Dr J. F. Tocher*, James Gray, Bailie William Brown, Peter C. Paterson.

Dairy Produce.—W. J. Thomson, James Cuthbert.

Honey, &c.—J. Martin.

Rural Industries.—Robert W. Fairweather, Robert Binnie, William Edmond, James More.

Buttermaking Competitions.—*T. G. Wilson*, Robert Watt, Thomas K. Bryce.

Horse-Shoeing and Shoe-Making. —*John E. B. Cowper*, *Thomas M'Lay*, *Peter Robertson*, William Thomson, Alexander Buchanan, Peter Christie, B. M'Call.

Flower Show.—W. Gilchrist Macbeth, William Peat.

VETERINARY DEPARTMENT.

Class Examinations, 1937.

Silver Medals were awarded to the following :—

GLASGOW VETERINARY COLLEGE.

Chemistry	Alexander B. Paterson, Glasgow.
Biology	Robert Auld, Stewarton.
Senior Anatomy	James L. Shaw, Troon.
Junior Anatomy	Andrew Wilson, Hull.
Physiology	Edward C. Straiton, Dalmuir.
Zootechny	Andrew Wilson, Hull.
Pathology	David L. Stewart, Millport.
Hygiene	Donald Macleod, Portree.
Surgery	Donald J. Macaulay, Lochmaddy.
Medicine	Hans A. M‘Clelland, Trabboch.
Histology	Andrew Wilson, Hull.
Pharmacology	Robert J. Smith, Strathpeffer.
Parasitology	William A. Whiteford, Paisley.

13 Large Silver Medals, £12, 0s. 6d.

ROYAL (DICK) VETERINARY COLLEGE.

Chemistry	E. Dixon, Lerwick.
Biology	J. Cruickshanks, Kirriemuir.
Senior Anatomy	W. S. Biggar, Dalbeattie.
Junior Anatomy	J. Millar, Newton-Stewart.
Physiology	J. M. Brown, Fauldhouse.
Zootechny	J. Millar, Newton-Stewart.
Pathology	W. Clark, Keswick.
Hygiene	J. H. Wilkins, Baghdad.
Surgery	J. Norval, Clackmannan.
Medicine	J. W. Whittick, Edinburgh.
Histology	E. A. M‘Pherson, Crieff.
Pharmacology	A. J. Maclennan, Edinburgh.
Parasitology	W. Clark, Keswick.

13 Large Silver Medals, £12, 0s. 6d.

DISTRICT COMPETITIONS, 1937.

23 Districts—	21 Grants of £12 each; 1 of £11, 15s.; and 1 of £11, 2s.	£274	17	0
14 ,,	Grants of £15 each	210	0	0
	Special Grants: Medals, £16, 14s. 6d.	206	14	6
	Medals for Shows (48 large)	44	8	0
	Premiums and Medals for Cottages, Gardens, &c. .	12	13	2
30 ,,	Medals for Hoeing Competitions, 1936-37. . .	11	12	6
145 ,,	Medals for Ploughing, 1936-37	72	10	0
Long Service Certificates, £32, 3s. 2d.; Gold Medals, £21, 12s. 3d. and Silver Medals, £37, 16s. (1936-37)		91	11	5
		£924	6	7

ABSTRACT OF PREMIUMS.

District Competitions.	£832	15	2
Long Service Awards.	91	11	5
Veterinary Colleges (26 Medals)	24	1	0
	£948	7	7

MELROSE SHOW, 1936.

ALTERATIONS IN PRIZE LIST.

On account of animals failing to comply with the Regulations as to calving and foaling, the following changes have taken place in the list of animals for which prizes were awarded ;—

CATTLE.

SHORTHORN.

CLASS 8. COW or HEIFER, born on or after 1st December 1933 and before 1st December 1934.—PREMIUMS, £10, £5, £3, and £2.

* No. 36 Smith, R. Laidlaw, Pittodrie, Pitcaple, Heifer, " Pittodrie Patricia " (172,492).

1st No. 35 Crawford and Balcarres, The Earl of, K.T., Balcarres House, Colinsburgh, Fife, Cow, " Balcarres Edna " (166,410).

HIGHLAND.

CLASS 40. HEIFER, born on or after 1st December 1932, and before 1st December 1933.—PREMIUMS, £10, £5, £3, and £2.

1st No. 275 Lees-Milne, Mrs, of Killundine, Drimnin, Oban, " Baravalla Smiorail II. of Killundine " (10,636).

2nd No. 273 Home, The Earl of, K.T., Douglas Castle, Lanark, " Proisaig Dubh " (10,706).

3rd No. 274 Home, The Earl of, K.T., Douglas Castle, Lanark, " Baravalla Milis " (10,707).

* No. 278 Walker, Francis W., of Leys, Leys Castle, Inverness, " Princess of Leys " (10,658).

4th No. 276 Southesk, The Earl of, Kinnaird Castle, Brechin, " Ban-Bharran of Southesk " (10,724).

V No. 277 Thomson, Misses S. W. & B. L., Glenpark, Balerno, Midlothian, " Princess Ruadh II. of Achnacloich " (10,718).

H No. 279 Walker, William, Avongrange, Hamilton, and Foreland, Isle of Islay, " Miarad Bhuidhe of Foreland " (10,956).

BRITISH FRIESIAN.

CLASS 55. HEIFER, born in 1934.—PREMIUMS, £10, £5, £3, and £2.

1st No. 384 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, Aberdeenshire, " Douneside Petunia " (188,474).

2nd No. 383 Innes, James C., Dunscroft, Gartly, Aberdeenshire, " Donside Osprey " (188,424).

The animals failing to qualify are marked thus (*).

3rd	No. 386	Weightman, Albert, Middle Herrington Farm, Sunderland, "Herrington Olive" (190,270).
*	No. 380	Christison, John, Crossveggate, Milngavie, "Crossveggate Dairymaid" (187,914).
4th	No. 378	Brewster, David, Shawhead, Coatbridge, "Hattrick Mary Brown 3rd" (190,098).
V	No. 385	MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, Aberdeenshire, "Douneside Elma 2nd" (188,454).
H	No. 381	Glentanar, Lord, Glen Tanar, Aboyne, "Glentanar Burella" (189,494 P.I.).
C	No. 382	Glentanar, Lord, Glen Tanar, Aboyne, "Glentanar Joulika" (189,502 P.I.).

HORSES.

CLYDESDALE.

CLASS 70. YELD MARE, born before 1933.—PREMIUMS, £15, £9, £6, and £4.

*	No. 482	M'Dowall, George, Briarbrae, Stranraer, "Lucinda."
1st	No. 484	Taylor, Robert, Milton Hall, Brampton Junction, Cumberland, "Queen o' Borgue."
2nd	No. 481	Goldie, David, Barassie, Troon, "Barassie Winifred."
*	No. 483	Pace, Ferrier, Ormiston Mains, Ormiston, "Lady Supreme."
*	No. 485	Templeton, T. & M., Sandyknowe, Kelso, "Sandyknowe Lady Iris."

The animals failing to qualify are marked thus (*).

STATE OF THE FUNDS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

As at 30th NOVEMBER 1937

I. British Government Securities—						
£25,000 3½ per cent War Loan, at 101½				£25,375	0	0
£1,679, 13s 4d 2½ per cent Consolidated Stock, at 75¼				1,263	19	0
£17,900 3½ per cent Conversion Loan, at 102				18,258	0	0
£2,500 3 per cent Do do at 101¾				2,543	15	0
£2,500 3 per cent Funding Loan, at 97¾				2,443	15	0
				£49,884	9	0
II Heritable Bonds—						
£12,500 at Commissioners' Rates				12,500	0	0
III Railway Debenture and Preference Stocks—						
£17,050 London and North Eastern Railway Co. 3 per cent Debenture Stock, at 79	£13,469	10	0			
£11,554 Do do 4 per cent do, at 103½	11,958	7	10			
£16,105 London Midland and Scottish Railway Co 4 per cent Debenture Stock, at 106	17,071	6	0			
£1,500 Do do 4 per cent Preference Stock, at 81	1,215	0	0			
£703 Southern Railway Co 4 per cent Debenture Stock, at 106½	748	14	0			
£450 Do. do 5 per cent Preference Stock, at 115	517	10	0			
£112 Do. do. 5 per cent Guaranteed Stock at 125	140	0	0			
				45,120	7	10
IV. Bank Stocks—						
£5,365 0 0 Royal Bank of Scotland Stock, at 465	£24,947	5	0			
£2,218 16 5 Bank of England Stock, at 341½	7,577	5	5			
£1,110 13 4 Bank of Scotland Stock, at 478	5,309	0	0			
2,850 "B" Shares, Barclays Bank, Ltd, at 76s	10,830	0	0			
				48,663	10	5
V. Colonial Government Stocks—						
£2,500 Dominion of Canada Registered 3½ per cent Stock (1930-50), at 103	£2,575	0	0			
£2,000 Western Australia Inscribed 4 per cent Stock (1942-62), at 102	2,040	0	0			
£2,000 New Zealand Government 5 per cent Inscribed Stock (1946), at 109	2,180	0	0			
£1,120 Victorian Government 3½ per cent Inscribed Stock (1929-49), at 99¼	1,111	12	0			
				7,906	12	0
Carry forward				£164,074	19	3

Brought forward .		£164,074 19 3
VI. TEMPORARY LOAN—		
£6,000 on Loan to Edinburgh Corporation . . .		6,000 0 0
VII. ESTIMATED VALUE of Building— 8 Eglinton Crescent	£5,000 0 0	
VIII. ESTIMATED VALUE of Furniture, Paintings, Books, &c.	1,500 0 0	
		6,500 0 0
IX. ARREARS OF SUBSCRIPTIONS considered recoverable . .		324 2 6
X. BALANCES at 30th November 1937		1,867 16 11
AMOUNT OF GENERAL FUNDS .		£178,766 18 8
XI. SPECIAL FUNDS—		
TWEEDDALE GOLD MEDAL FUND—		
£605 London and North-Eastern Railway Co. 4 per cent Debenture Stock, at 103½		£626 3 8
£100 3 per cent Local Loans Stock, at 87 . .		87 10 0
		£713 13 8
FIFE AND KINROSS PERPETUAL GOLD CHALLENGE CUP FUND—		
£268 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 79 . . .	£211 14 5	
£201 Do. do. 4 per cent First Guaranteed Stock, at 95 . . .	190 19 0	
Sum on Deposit Receipt with British Linen Bank	43 7 1	
		446 0 6
PAISLEY PERPETUAL GOLD CHALLENGE CUP FUND—		
£802 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 79 . . .	£633 11 8	
Sum on Deposit Receipt with British Linen Bank	94 6 6	
		727 18 2
RENFREWSHIRE PERPETUAL GOLD CHALLENGE CUP FUND—		
£668 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 79 . . .	£527 14 5	
Sum on Deposit Receipt with British Linen Bank	87 1 5	
		614 15 10
WILLIAM TAYLOR MEMORIAL PRIZE FUND—		
£401 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 79 . . .	£316 15 10	
Sum on Deposit Receipt with British Linen Bank	73 1 6	
		389 17 4
WILLIAM DUTHIE PERPETUAL SILVER CHALLENGE CUP FUND—		
£260 2½ per cent Consolidated Stock, at 75¼ . .		195 13 0
THE JAMES ARCHIBALD PRIZE—		
£612, 1s. 6d. 3½ per cent War Loan, at 101½ . .		621 5 1
KINMONTH GOLD QUAICH FUND—		
£46, 13s. 6d. 3½ per cent War Loan, at 101½ . .		47 7 6
BALANCES WITH BANKS at 30th November 1937 . .		143 2 8
AMOUNT OF SPECIAL FUNDS . .		£3,899 13 9

EDINBURGH, 28*th December* 1937.—As Auditor of the Highland and Agricultural Society of Scotland, I have examined the Securities for the Investments as detailed in the above States of Funds and have found them in order. The Titles to the Heritable Estate and the Bonds for Sums lent on Heritable Security are certified by the Society's Law Agents to be in order.

GEO. JAMES GREGOR, C.A.

HOME, *Treasurer.*

J. P. ROSS-TAYLOR, *Chairman of Directors.*

EDINBURGH, 5*th January* 1938.

ABSTRACT of the ACCOUNTS of the HIGHLAND and

CHARGE.

1. **Balances** at 30th November 1936		£1,834 13 10
2. **Arrears** of Subscriptions outstanding at 30th November 1936	£253 6 6	
Whereof due by Members who have compounded for life, and whose arrears are thereby extinguished	14 13 6	
		238 13 0
3. **Interests and Dividends**—		
(1) Interests—		
On Heritable Bonds, less Income-tax .	£330 17 3	
On Railway Debenture and Preference Stocks, do.	1,311 7 10	
On Colonial Government Stocks, do. .	231 18 10	
On British Government Stocks, do. .	1,493 19 10	
On Temporary Loans, do. . . .	27 16 9	
	£3,396 0 6	
(2) Dividends on Bank Stocks, less Income-tax .	1,344 0 7	
		4,740 1 1
4. **Subscriptions**—		
Annual Subscriptions	£2,476 10 0	
Life Subscriptions	1,221 14 0	
		3,698 4 0
5. '**Transactions**'—Sales and Other Receipts . . .		53 18 6
6. **Income-tax** repaid for year to 5th April 1937 . . .		1,217 14 1
7. **Balance** of Receipts from Melrose Show, 1936 . . .		173 15 5
8. **Receipts** from Alloa Show, 1937		21,130 2 10
9. N.D.A. **Examination**, 1937—Share of Net Receipts . .		18 18 9
10. N.D.D. **Examination** at Ayr, 1936—Refund of Expenses .		96 19 6
Sum of Charge . .		£33,203 1 0

Edinburgh, 28*th December* 1937.—As Auditor of the Highland and Agricultural
of the Society for the year ending 30th November 1937 and have found them to be
Accounts I have prepared an Account of Charge and Discharge of the Intromissions
1937, of which the above is an Abstract.

Edinburgh, 5*th January* 1938.

AGRICULTURAL SOCIETY of SCOTLAND for Year 1936-1937.

DISCHARGE.

1. Establishment Expenses		
Salaries and Wages and Allowance for Cleaning		£3,190 16 8
Retiring Honorarium to J. G. Yardley		100 0 0
Allowances to Mrs Simpson and Mrs Cowie		112 10 0
Feu-duty, £22, 4s. 11d.; Rates and Taxes, £114, 14s. 8d.		136 19 7
Coal, Gas, and Electric Light		80 16 3
Insurances, £66, 0s. 10d.; Special Annuity Premium, £51, 3s. 9d.; Superannuation Scheme, £108, 5s. 0d.; Telephone and Telegrams, £58, 19s. 2d.; Repairs and Furnishings, £69, 16s. 9d.		354 5 6
		£3,975 8 0
2. Fee to Auditor of Accounts for 1935-1936		120 0 0
3. Chemical Department—		
Fee to Chemist	£100 0 0	
Analyses for Members and Expenses	285 15 9	
		385 15 9
4. Veterinary Department—Medals to Students		24 1 0
5. Dairy Department—N.D.D. Examination, 1936		54 7 3
6. Dairy Department, 1937—		
Expenses of N.D.D. Examination held at Ayr	£273 6 0	
Less Entry Fees	148 1 0	
		125 5 0
7. Society's 'Transactions'		1,819 12 0
8. Ordinary Printing, £290, 18s. 3d.; Advertising, £41, 7s. 9d.; Stationery, Books, &c., £157, 16s. 6d.; Postages and Receipt Stamps, £122, 9s. 4d.		612 11 10
9. Retiring Allowance to Professor Stanfield, Consulting Engineer		150 0 0
10. Salary to Master of Works		300 0 0
11. Miscellaneous Payments		356 18 10
12. Balance of Expenses in connection with Melrose Show, 1936		245 9 9
13. Expenses in connection with Alloa Show, 1937— Premiums, £3593, 15s. 0d; Medals, £63, 15s. 0d.; Expenses of Show, £13,517, 13s. 8d. (as per page 451)		17,175 3 8
14. Premiums and Medals for Local Shows and District Competitions		984 8 6
15. Certificates and Medals for Long Service		91 11 5
16. Expenses in connection with visiting sites for future Shows, attending Meetings, &c.		36 8 7
17. Special Grants— Animal Diseases Research Association, £200; Glasgow Veterinary College, £100; Scottish Agricultural Organisation Society, £100; Royal (Dick) Veterinary College, Building Extension Fund, £500; other Grants, £147, 7s. 0d.		1,047 7 0
18. Temporary Loans—		
Lodged	£6000 0 0	
Less Uplifted	2000 0 0	
		4,000 0 0
19. Arrears removed from Subscription List at 30th November 1937		56 18 0
20. Arrears of Subscriptions outstanding at 30th November 1937		324 2 6
21. Balances at 30th November 1937—		
On Account Current with Royal Bank of Scotland—		
Edinburgh Account	£1,723 13 4	
London Account	134 10 0	
	£1,858 3 4	
In hands of Secretary	9 13 7	
	£1,867 16 11	
Less: Timber Equalisation Fund	500 0 0	
		1,367 16 11
Sum of Discharge		£33,203 1 0

Society of Scotland, I beg to report that I have examined the Books and Accounts correctly stated and sufficiently vouched and instructed. From the Books and of the Treasurer with the Funds of the Society for the year ending 30th November

GEO. JAMES GREGOR, C.A.

HOME, *Treasurer.*
J. P. ROSS-TAYLOR, *Chairman of Directors.*

ABSTRACT of the ACCOUNTS

CHARGE.

1. AMOUNT COLLECTED DURING SHOW—		
Gates		£8,530 4 2
Grand Stand		2,076 9 7
Catalogues and Awards		779 4 10
Tickets sold—supplies, &c.		28 1 6
Chauffeurs' Tickets		43 4 0
Cloak-Rooms and Lavatories		145 10 7
		£11,602 14 8
2. FORAGE SOLD		3 1 10
3. MOTOR ENCLOSURES		1,205 14 0
4. RENT OF STALLS—		
Implement and other Exhibits	£4,715 7 6	
Stock Exhibits	2,329 15 0	
		7,045 2 6
5. RENT OF REFRESHMENT BOOTHS		635 10 0
6. ADVERTISEMENTS IN CATALOGUE AND PREMIUM LIST		317 17 5
7. SUBSCRIPTIONS IN AID OF PREMIUMS		239 10 0
8. MISCELLANEOUS		80 12 5
		£21,130 2 10

Note.—To the credit balance of		£3954 19 2
Add Sums due by Exhibitors for fitting up of stands, &c., amounting to		230 0 0
		£4184 19 2
From the above balance there falls to be deducted		
Premiums undrawn at 30th November 1937	£134 10 0	
Accounts outstanding	48 16 1	
		183 6 1
Making the probable surplus		£4001 13 1

EDINBURGH, *5th January* 1938.

of the ALLOA SHOW, 1937.

DISCHARGE.

1. SHOWYARD—						
Fitting up of Showyard				£2,630	0	0
Muirhead & Sons Ltd.—Hire of Timber (including £500 transferred to Timber Equalisation Fund) . . .				2,630	1	10
Thomas Black & Sons Ltd.—Hire of Canvas . . .				1,627	12	2
Rent of Showground				100	0	0
Rosettes, £38, 7s. 9d.; Penning and Cartage Charges on Poultry, £48, 12s. 6d.; Horse-Shoeing, £8, 15s. 2d.; Butter-making, £42, 15s. 4d.; Electric Light and Power, £70, 12s. 6d.; Hire of Sleepers and Cartage, £204, 0s. 3d.; Office Luggage, £10, 0s. 0d.; Toilet Requisites, &c., £8, 19s. 8d.; Flower Show, £52, 0s. 0d.; Floral Decorations, £19, 5s. 6d.; Miscellaneous, £20, 11s. 1d. . .				523	19	9
Salary to John Reid, Showyard Erector				500	0	0
				£8,011	13	9
2. FORAGE AND BEDDING FOR STOCK				416	15	0
3. POLICE				201	11	8
4. TRAVELLING EXPENSES of Judges, Stewards, and Staff . .				220	1	3
5. HOTELS AND LUNCHEONS—						
Hotels for Directors, Stewards, and Judges .	£283	14	1			
Luncheons in Showyard for Directors, Judges, Attending Members, Pressmen, Staff (including accommodation), Breakfasts, and Teas . .	447	7	6			
				731	1	7
6. ASSISTANTS and Show Staff				625	2	7
7. MUSIC and Military Display Teams, &c.				504	0	11
8. PRINTING, Members' Badges, Stationery, &c. . . .				1,380	10	9
9. ADVERTISING and Bill-posting				919	14	2
10. FORESTRY Exhibition, £40; Concert for Attendants, £3, 19s. 0d.				43	19	0
11. VETERINARY SURGEON				21	0	0
12. SHOW TREASURER				100	0	0
13. POSTAGES				122	3	10
14. POST OFFICE and Telephones				12	17	9
15. AMBULANCE				11	7	0
16. INSURANCES				114	1	3
17. MISCELLANEOUS				81	13	2
				£13,517	13	8
18. PREMIUMS drawn at 30th November 1937				3,657	10	0
				£17,175	3	8
CREDIT BALANCE . .				3,954	19	2
				£21,130	2	10

HOME, *Treasurer.*
J. P. ROSS-TAYLOR, *Chairman of Directors.*
GEO. JAMES GREGOR, C.A., *Auditor.*

ABSTRACT of the ACCOUNTS of the

CHARGE.

I. FUNDS as at 30th November 1936—			
£3,193 London and North-Eastern Railway Company 3 per cent Debenture Stock			£2,650 0 0
£5,551, 16s. 3d. 3½ per cent Conversion Stock			4,216 18 2
£500 Queensland 3½ per cent Inscribed Stock, 1950-70			450 1 0
£412 London Midland and Scottish Railway Company 4 per cent Debenture Stock			611 10 6
£190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock			259 1 11
			£8,187 11 7
BALANCES with Royal Bank of Scotland—			
On Account Current		£354 9 5	
On Deposit Receipt		178 5 3	
			532 14 8
			£8,720 6 3
II. INTEREST ON INVESTMENTS—			
On £3,193 London and North-Eastern Railway Company 3 per cent Debenture Stock, for year to 30th June 1937		£95 15 10	
Less tax		23 7 0	
		£72 8 10	
On £5,551, 16s. 3d. 3½ per cent Conversion Stock, for year to 1st October 1937	£194 6 2		
Less tax	47 7 2		
		146 19 0	
On £500 Queensland 3½ per cent Inscribed Stock, 1950-70, for year to 1st July 1937	£17 10 0		
Less tax	4 5 3		
		13 4 9	
On £412 London Midland and Scottish Railway Company 4 per cent Debenture Stock, for year to 30th June 1937	£16 9 6		
Less tax	4 0 4		
		12 9 2	
On £190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock, for year to 30th June 1937	£7 12 0		
Less tax	1 17 1		
		5 14 11	
			250 16 8
III. INTEREST ON DEPOSIT RECEIPT			1 15 5
IV. INCOME-TAX repaid for year to 5th April 1937			78 15 4
SUM OF CHARGE			£9,051 13 8

EDINBURGH, *5th January* 1938.

ARGYLL NAVAL FUND for the Year 1936-1937.

DISCHARGE.

I. ALLOWANCES to Recipients, as follows:			
3 at £40 each			£120 0 0
2 at £20 each			40 0 0
			£160 0 0
II. MISCELLANEOUS PAYMENTS—			
John Menzies & Co.—Advertising . .		£7 5 9	
Geo. Waterston & Sons Ltd.—Stationery .		0 6 6	
Wm. Blackwood & Sons Ltd.—Printing .		1 9 0	
			9 1 3
III. FUNDS at 30th November 1937—			
£3,193 London and North-Eastern Railway Company 3 per cent Debenture Stock .		£2,650 0 0	
£5,551, 16s. 3d. 3½ per cent Conversion Stock .		4,216 18 2	
£500 Queensland 3½ per cent Inscribed Stock, 1950-70		450 1 0	
£412 London Midland and Scottish Railway Company 4 per cent Debenture Stock .		611 10 6	
£190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock .		259 1 11	
		£8,187 11 7	
Note.—The above Funds are entered at cost price. The market value at 30th November 1937 was £9,318, 18s. 9d.			
Balances with Royal Bank of Scotland—			
On Account Current . .	£515 0 2		
On Deposit Receipt . .	180 0 8		
		695 0 10	
			8,882 12 5
SUM OF DISCHARGE . .			£9,051 13 8

HOME, *Treasurer.*
J. P. ROSS-TAYLOR, *Chairman of Directors.*
GEO. JAMES GREGOR, C.A., *Auditor.*

VIEW OF RECEIPTS AND PAYMENTS for Year 1936-1937.

RECEIPTS.

INTEREST AND DIVIDENDS				£4,740	1	1
INCOME TAX REPAID for year to 5th April 1937				1,217	14	1
				£5,957	15	2
ANNUAL SUBSCRIPTIONS AND ARREARS received				2,334	7	6
ALLOA SHOW—						
Receipts	£21,130	2	10			
Payments	17,175	3	8			
				3,954	19	2
				£12,247	1	10

PAYMENTS.

ESTABLISHMENT EXPENSES (see page 449)	£3,975	8	0			
FEE TO AUDITOR for 1935-1936	120	0	0			
CHEMICAL DEPARTMENT	385	15	9			
VETERINARY DEPARTMENT	24	1	0			
EDUCATION	63	14	0			
RETIRING ALLOWANCE TO CONSULTING ENGINEER	150	0	0			
MASTER OF WORKS	300	0	0			
SOCIETY'S 'TRANSACTIONS'	1,765	13	6			
ORDINARY Printing, Stationery, Advertising, and Miscellaneous Accounts	1,077	13	7			
GRANTS TO LOCAL SOCIETIES, &c.	1,025	19	11			
	£8,888	5	9			
Extraordinary Expenditure—						
Special Grants (see page 449)	1,047	7	0			
				9,935	12	9
SURPLUS				£2,311	9	1
Extraordinary Income—						
Life Subscriptions				1,221	14	0
BALANCE OF RECEIPTS				£3,533	3	1

HOME, *Treasurer.*
J. P. ROSS-TAYLOR, *Chairman of Directors.*
GEO. JAMES GREGOR, C.A., *Auditor*

EDINBURGH, *5th January* 1938.

PROCEEDINGS AT BOARD MEETINGS.

MEETING OF DIRECTORS, 7TH APRIL 1937.

Mr J. P. Ross-Taylor, Mungoswalls, Duns, in the Chair.

Present.—Ordinary Directors—Mr John D. Allan; Major R. F. Brebner; Mr William Brown; Mr Thomas Clark; Lieut.-Colonel Gordon Beauchamp Duff, D.S.O.; Mr George Grant; Mr J. E. Kerr; Mr James R. Lumsden; Mr William Meiklem; Mr William Montgomery; Mr Alexander Murdoch; Mr James Paton; Mr John W. Prentice; Mr Charles W. Ralston; Mr J. P. Ross-Taylor; Lord Rowallan; Hon. W. T. H. Scott, Master of Polwarth; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr James Wither, Mr James Wyllie. *Extraordinary Directors*—Mr Walter A. Aitkenhead; Mr A. Y. Allan; Mr Ian M. Campbell; Mr John E. B. Cowper; Captain Thomas Elliot; Mr W. P. Gilmour; Mr John Hewetson; Mr James M'Laren; Mr Thomas M'Lay; Mr Gavin Ralston; Mr Peter Robertson; Major S. Strang Steel; Mr Andrew H. Telfer; Mr T. G. Wilson. *Treasurer*—The Earl of Home, K.T. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

Letters.

The following letters were submitted:—

Mr Hugh Elder, Bughtknowe, Humbie.—Expressing thanks for resolution of sympathy on the death of his father, the late Mr Thomas Elder of Stevenson.

Scottish Agricultural Organisation Society, Ltd.—Conveying thanks for grant of £100 for the current year.

Death of Oldest Member.

The Secretary reported that the death had occurred that week of the Society's oldest member, Mr W. G. Turnbull, who resided for a time in the Border district, but latterly at Colinton, Midlothian. Mr Turnbull, who celebrated his ninety-third birthday recently, became a member of the Society in 1863, so that his membership extended to almost seventy-four years.

Alloa Show, 1937.

Catering.—A Minute of Meetings of Catering Committee, held on 2nd February, 3rd March, and 6th April, was submitted and approved.

The Minute recommended the appointment of the following four Caterers:—

Royal Athenæum, Ltd., Union Street, Aberdeen.
Messrs M. Mitchell & Co., Ltd., 2 Gloucester Place, Edinburgh.
Messrs Westcon, Ltd., 41 Mill Street, Ayr.
Mr E. Pfeiffer, 82 Great King Street, Edinburgh.

The Committee recommended that the Snack Counter and Refreshment Bar, between the Members' and Lady Members' Pavilions, be restricted to teas and light refreshments, and that a Snack Counter and Refreshment Bar be provided at the back of the Members' Pavilion, where alcoholic drinks would be served.

It was further recommended that the official catering in the Directors' Private Luncheon Room, for Directors and Judges, be placed in the hands of Mr Pfeiffer, Edinburgh, and that the Licensed Bar and Tea-room in the Members' Pavilion be in the hands of Messrs M. Mitchell & Co., Ltd., Edinburgh, who should also have charge of the Press Luncheon Counter.

The Alloa Branch of the British Women's Temperance Association would, as usual, have an Unlicensed Refreshment Stand.

The condition that only home-fed meat shall be supplied in the Catering Stands was again imposed on all the Caterers.

Shetland Goods.—It was decided to grant the Shetland Federation of the S.W.R.I. a stand with 20 feet frontage, in section 4, at half rates—£6.

Cushions.—It was decided to arrange with the London Cushion Company for the supply of cushions for hire at the Show.

Tomato and Egg Competitions.—A letter was submitted from the Department of Agriculture for Scotland, requesting permission to stage Tomato and Egg Competitions in an annexe to their Pavilion at the Show, in conjunction with a display of Scottish National Mark Products, and with cinema films on the processing and preparation of those products.

It was decided that the request be granted.

Dumfries Show, 1938.

It was decided that the date of the Show at Dumfries in 1938 be fixed for the 21st to 24th June inclusive.

Grants to Local Societies.

A Minute of Meeting of the Committee appointed on 2nd December was submitted and approved.

The Minute dealt with the following matters :—

Grants to Horse Associations.—After careful consideration, the Committee recommended that the Rule at present in force, which states that the £15 grant to Horse Associations shall be used by the Association or Society for the purpose of enabling it to secure a better class of Stallion, should be retained, as it was not clear that any alteration would better serve the object in view. It was further recommended that these grants of £15 be given in future in three consecutive years, instead of in the first, third, and fifth years of a series of five years. It was also recommended that Associations which have received a complete series of grants shall not be eligible to apply again until after the lapse of three years.

Grants to Federations of S.W.R.I.—The Committee had also considered the question of framing Regulations to govern Grants to Federations of Scottish Women's Rural Institutes. In the past, those £10 grants had been given to Federations without conditions as to the manner in which they were to be used.

The Committee decided to recommend that Regulations should now be made to govern their use. These Regulations would follow the general lines of the Regulations applicable to Grants to Local Agricultural Societies, but the following would apply in particular to the Federation Grants :—

> 6. *Application of Grant.*—The grant of £10 shall not be applied as a grant-in-aid to the general funds of the Federation, but must be offered in the form of Prizes at any Show or Competition held under the auspices of the Federation.
>
> 7. *Announcement of Grant.*—The offer of Prizes must be announced in the Prize List or Catalogue of the Show or Competition as "presented by the Highland and Agricultural Society of Scotland," or the amount of the grant must be shown as a separate item of donation in the published Statement of Accounts.

Maintenance of Hedges.

A Minute of Meeting of Special Committee, appointed on 3rd February, was submitted and approved.

The Minute stated that the Committee had considered the letter from Sir John H. Milne Home, in which he suggested that encouragement might be given by the Society, by means of Competitions or otherwise, for the maintenance of hedges, through laying and other improved methods of management.

The Committee recommended that action be taken by the Directors on the lines suggested in Sir John's letter. As a first step, they proposed that demonstrations be arranged during the first three months of 1938, these demonstrations to be given by skilled craftsmen. One series of demonstrations might be given in Dumfriesshire, and another series in the Border District. It was suggested that Local Committees be formed in the different districts or Counties, consisting of the Local Directors of the Society and representatives of Hunts, or such other bodies as it may be decided to co-opt.

Finance.

A Minute of Meeting of Finance Committee, dated 7th April, was submitted and approved.

The Minute dealt with the following matters:—

Glasgow Veterinary College.—It was recommended that the grant of £100 to the Glasgow Veterinary College, which had been given for the past seven years, be renewed for the current year.

Consulting Entomologist.—It was recommended that it be remitted to the following Sub-Committee to meet Dr Cameron and discuss with him certain proposals he had made with regard to the designation of his office, and also the expenses incurred in carrying out researches: Major R. W. Sharpe, Mr J. P. Ross-Taylor, Colonel F. J. Carruthers, and the Earl of Home, K.T.

Superannuation Scheme for Society's Staff.—The Secretary submitted particulars which he had obtained with regard to a Superannuation Scheme for the Society's Staff. The Scheme was based upon the principle of endowment policies taken out with an insurance company, maturing at age sixty-five in the case of men, and sixty in the case of women. The amount of the premium payable in each case would be not less than 10 per cent of the salary, 5 per cent being paid by the employee and 5 per cent by the Society. In the case, however, of members of the staff who had been many years in the Society's employment, or who entered the service at an older age, some additional provision might require to be made in the way of a larger contribution by the Society.

It was recommended that the matter be remitted to the following Sub-Committee for consideration in detail, and report: Mr Alexander Murdoch, Mr James R. Lumsden, Mr William C. Hunter, with the Chairman, Treasurer, and Honorary Secretary, *ex officii.*

MEETING OF DIRECTORS, 5TH MAY 1937.

Mr J. P. ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present.—Ordinary Directors—Mr John D. Allan; Major R. F. Brebner; Mr William Brown; Mr Thomas Clark; Lieut.-Colonel Garden Beauchamp Duff, D.S.O.; Mr William I. Elliot; Mr George Grant; Mr J. E. Kerr; Mr James R. Lumsden; Mr William Meiklem; Mr William Montgomery; Mr Alexander Murdoch; Mr James Paton; Mr John W. Prentice; Mr Charles W. Ralston; Mr J. P. Ross-Taylor; Lord Rowallan; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr A. A. Haggart Speirs; Mr Thomas Templeton; Mr Francis W. Walker; Mr James Wither; Mr James Wyllie. *Extraordinary Directors*—Mr Walter A. Aitkenhead; Mr A. Y. Allan; Mr John E. B. Cowper; Mr James Durno; Captain Thomas Elliot; Mr W. P. Gilmour; Mr James M'Laren; Mr William M'Laren; Mr Thomas M'Lay; Mr Gavin Ralston; Major S. Strang Steel; Mr Andrew H. Telfer. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont. *Chemist*—J. F. Tocher, D.Sc., LL.D. F.I.C.

The late Mr J. Bryce Duncan of Newlands.

Before proceeding with the business of the Meeting, the Chairman referred, with deep regret, to the death, since last Meeting, of a former member of the Board, Mr John Bryce Duncan of Newlands, Dumfries. Mr Bryce Duncan, he said, was a member of the Society for over forty years, and served as a Director for a period of five years. He took a prominent part, for many years, in the agricultural and public life of Dumfriesshire. He was actively identified with the work of many public bodies, in all of which his business capacity and shrewd judgment led to his occupying positions of responsibility. As an agriculturist, he was well known as a breeder of various classes of live-stock. His death was a loss to agriculture and to the Society, and to the many public bodies with which he was so long connected.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the widow and family of the deceased.

Importation of Pedigree Animals Act, 1925.

A letter was submitted, dated 1st May, from the Ministry of Agriculture and Fisheries with regard to a proposed importation of a Tamworth Boar from Australia. The boar was registered as "Zillvale Skipper," No. 2353, in Volume XXV. of the Australian Stud Pig Herd-Book. In accordance with the terms of the above Act, the Society was asked to give its views as to whether the Herd-Book in which the animal was registered should be recognised.

It was decided that a reply be sent to the Ministry to the effect that the Directors were of opinion that the Stud Pig Herd-Book mentioned should be recognised for the purposes of the Importation of Pedigree Animals Act.

Alloa Show.

Catering.—A Minute of Meeting of Catering Committee, dated 4th May, was submitted and approved.

The Minute stated that, in view of the withdrawal of one of the Licensed Caterers mentioned at last Meeting, the Committee had decided that there be three Licensed Caterers on this occasion:—

Royal Athenæum, Ltd., Union Street, Aberdeen.
Messrs Westcon, Ltd., 41 Mill Street, Ayr.
Mr E. Pfeiffer, 82 Great King Street, Edinburgh.

The Royal Athenæum would occupy two of the four stands.

As previously reported, the official catering for Directors and Judges would be in the hands of Mr Pfeiffer, Edinburgh, while the Licensed Bar and Tea-room in the Members' Pavilion, and also the Press Luncheon Counter, would be in the hands of Messrs Westcon, Ltd., Ayr.

Physical Training Display.—A Minute of Meeting of Stewards, dated 7th April, was submitted and approved.

The Minute recommended that the Display Team of the Argyll and Sutherland Highlanders be engaged to give performances on Wednesday, Thursday, and Friday afternoons in the Main Square, a space 45 × 45 yards to be roped off for this purpose.

The Minute also recommended that Major R. F. Brebner be appointed Assistant Steward of Special Events.

Judge of Hunters.—The Secretary reported that Mr Hope-Johnstone had intimated his inability to act as Judge of Hunters, on account of illness, and that, accordingly, the Reserve Judge, Mr Fred. Porter, Cocklaw, Cockburnspath, had been approached, and had agreed to act.

Inspection of Growing Crops of Potatoes.

A letter was submitted from the Department of Agriculture for Scotland, forwarding copies of the Notes of a Meeting held on 24th March with representatives of the National Farmers' Union with regard to the Scheme for Inspection of Potato Crops, and also copy of a letter sent by the Department to the Union.

Mr John E. B. Cowper and Mr James Paton, who represented the Society at Meetings with the Department with regard to the inspection of growing crops of potatoes, expressed the view that it was desirable that the standard set for this year should be regarded as a trial, and that Agricultural bodies should be given an opportunity of being heard before the standard was fixed for 1938.

Fertilisers and Feeding-stuffs Act, 1926.

A letter was submitted from the County Council of Angus with regard to a proposed amendment of the Fertilisers and Feeding-stuffs Act, 1926. Accompanying the letter was a copy of a letter from the Inspector of Weights and Measures for the County, and a Memorandum dealing fully with the subject.

It was agreed that the matter be remitted to the Science Committee for consideration and report.

Animal Diseases Research Association.

An application from the Animal Diseases Research Association for a renewal for the current year of the grant of £200, which had been given for the past eleven years, was submitted.

On the recommendation of the Finance Committee, it was decided that the application be granted.

Glasgow Veterinary College.

On the motion of the Chairman, it was unanimously agreed to confirm the proposed grant of £100 for the current year to the Glasgow Veterinary College.

Presentation to Mr J. G. Yardley.

The Chairman said that, as this was the last occasion on which Mr J. G. Yardley, Chief Clerk, would be with them officially, he thought it right that the occasion should not be allowed to pass without formally congratulating him on his appointment to a new and important post, and wishing him all success as Secretary of the Bath and West and Southern Counties Society. Mr Yardley, he said, had been in the service of the Highland and Agricultural Society for fifteen years. He came to the Society more or less as a youth, but he very soon showed his aptitude for the work. In particular, his efficiency was so pronounced that the Directors, when the occasion occurred, appointed him Chief Clerk and Cashier of the Society. Amongst his many good qualities, the most pronounced was that of efficiency, and the service he had rendered to the Society could be said to be thorough. Knowing that, it was with confidence they sent him South, feeling that he would make a success of his post with the Bath and West.

The Chairman then handed to Mr Yardley a cheque for £100, being an honorarium from the Society, and an inscribed cigarette case and cheque, being a personal parting gift from the Directors.

Mr J. G. Yardley, in thanking the Directors for the gifts, expressed his appreciation of the very kind way in which the Chairman had referred to his services, and of the very courteous treatment he had always received from the Directors of the Society. He also referred to the encouragement he had received from the Secretary and support from the members of the Staff.

Proposed Junior Certificate in Agriculture.

Colonel F. J. Carruthers, Convener of the Education Committee, made a statement with regard to a proposal for the establishment of a Junior Certificate in Agriculture. The proposal originated from Mr Lamb, of the Bell-Baxter School, Cupar, Fife, who submitted a statement containing the outline of a scheme to the National Agricultural Examination Board. The proposed scheme had been examined by that Board, and certain alterations made thereon. It would be sent shortly to the Society and the Royal Agricultural Society of England for their consideration.

The intention was that the Certificate should be for men and women engaged in farm work who were unable to give attendance at the Agricultural Colleges. The Syllabus would be on the lines of the Syllabus of the National Diploma in Agriculture, but the Examination would be on a lower standard.

It was decided that, when the scheme was received, the Education Committee should discuss it with the Department of Agriculture for Scotland and the Department of Education for Scotland.

MEETING OF DIRECTORS, 2ND JUNE 1937.

Mr J. P. Ross-Taylor, Mungoswalls, Duns, in the Chair.

Present.—Ordinary Directors—Major R. F. Brebner; Mr William Brown; Lieut.-Colonel Garden Beauchamp Duff, D.S.O.; Mr William I. Elliot; Mr George Grant; Mr J. E. Kerr: Mr James R. Lumsden; Mr William Meiklem; Mr William Montgomery; Mr Alexander Murdoch; Mr John W. Prentice; Mr Charles W. Ralston; Mr J. P. Ross-Taylor; Hon. Walter T. H. Scott, Master of Polwarth; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr Thomas Templeton; Mr Francis W. Walker; Mr James Wither. *Extraordinary Directors*—Mr Walter A. Aitkenhead; Mr A. Y. Allan; Mr John E. B. Cowper; Mr James Durno; Captain Thomas Elliot; Mr Alexander Forbes; Mr W. P. Gilmour; Mr John Hewetson; Mr James M'Laren; Mr Thomas M'Lay; Mr Gavin Ralston; Mr Peter Robertson; Mr Andrew H. Telfer; Mr T. G. Wilson. *Treasurer*—The Earl of Home, K.T. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

Coronation of Their Majesties the King and Queen.

The Chairman reported that he had attended, as representing the Society, the Coronation of Their Majesties King George VI. and Queen Elizabeth, in Westminster Abbey, on 12th May. He felt it was a great privilege to be present at the Ceremony, and he thanked the Board of Directors for the honour they had done him in appointing him to represent the Society.

Letters.

The following letters were submitted:—

Mrs Duncan, Newlands, Dumfries.—Expressing thanks for resolution of regret and sympathy on the death of her husband, the late Mr J. Bryce Duncan.

Department of Agriculture for Scotland.—Notice to Potato Growers regarding the danger of the introduction of the Colorado Beetle, and giving full particulars and illustrations.

Eradication of Animal Diseases.

The Secretary reported that he had received from the Secretary of the Department of Agriculture for Scotland, two days prior to the Meeting, a letter forwarding a copy of a Memorandum containing the Government's proposals in regard to the Eradication of Animal Diseases. The letter stated that the Department would be glad to receive any observations the Society might have to offer. The Memorandum dealt with proposals for routine clinical inspection of herds, tuberculin test survey of self-contained herds, establishment of attested areas, diseases of other farm animals, including poultry, and the establishment of a centralised veterinary service.

The Chairman said the matter would require a good deal of consideration, and he proposed that it be remitted to the Science Committee. It was not a question of immediate urgency, because the whole of the long-term policy was open to a certain amount of criticism.

The remit to the Science Committee was agreed to.

Alloa Show, 1937.

Sheep Dog Demonstrations.—The Secretary reported that Mr J. M. Wilson, Whitehope, Innerleithen, who had given the Sheep Dog Demonstrations at the Shows for several years, would again demonstrate this year on the Wednesday evening, Thursday afternoon and evening, and Friday afternoon.

Mr James M'Laren, Cornton, Bridge of Allan, kindly agreed to make arrangements for securing sheep for the demonstrations.

British Friesian Cattle Society.—A letter was read from the British Friesian Cattle Society offering a Silver Challenge Cup, value Fifty Guineas, for the best group of three animals in the British Friesian Classes—to replace the cup won outright last year.

It was decided that the cup be accepted, and that the cordial thanks of the Directors be conveyed to the Council of the British Friesian Cattle Society for their handsome offer.

Colouring of Sheep.—The following small Committee was appointed to advise with the Stewards of Sheep with regard to any question of colouring in which the Stewards desired assistance: Mr Alexander Murdoch, Major R. F. Brebner, Dr J. F. Tocher, with the Chairman, *ex officio.*

Hospitality Committee. The following were appointed a Committee to meet with Overseas Visitors at the Show and extend such hospitality as might be found practicable: Mr Alexander Murdoch, Major R. F. Brebner, and Mr G. Bertram Shields.

Show of 1939.

The Secretary reported that negotiations were proceeding with the Corporation of Edinburgh regarding a site for the Show of 1939. These negotiations had not yet reached a stage at which any definite report could be submitted.

Animal Diseases Research Association.

On the motion of The Earl of Home, K.T., Treasurer, it was unanimously agreed to confirm the proposed grant of £200 for the current year to the Animal Diseases Research Association.

Science.

A Minute of Meeting of Science Committee, dated 2nd June, was submitted and approved.

The Minute dealt with the following matters:—

Prices of Feeding-Stuffs.—The Meeting had been held, along with representatives of the Trade, to consider the prices of Feeding-Stuffs as at that date. A Schedule of these prices was adjusted, and it was proposed that it be printed and issued in similar manner to the Schedule of Unit Prices issued in February.

Fertilisers and Feeding-Stuffs Act, 1926.—In accordance with the remit from the Board, the Committee had considered the letter from the County Council of Angus, forwarding a letter and Memorandum by the Inspector of Weights and Measures for the County, with regard to suggested amendments of the Fertilisers and Feeding-Stuffs Act, 1926. Along with this was submitted a Memorandum on the subject, prepared by the Society's Consulting Chemist, Dr J. F. Tocher.

After careful consideration, the Committee decided to recommend that no action be taken in the matter, and that the Secretary be instructed to reply accordingly to the County Council of Angus, and at the same time to send him a copy of Dr Tocher's Memorandum.

Finance.

A Minute of Meeting of Committee, dated 2nd June, was submitted and approved.

The Minute dealt with the following matters:—

Superannuation Scheme for Society's Staff.—The Committee had before them the Minute of a Sub-Committee which had given careful consideration to the proposed Superannuation Scheme. The Sub-Committee pointed out that the Scheme, as then contemplated, would entail an annual contribution by the Society of about £140. The intention was that the Policies at maturity should provide a sum which, if converted into an annuity, would secure an annual pension to the member of approximately half of the salary. The Scheme did not include the Secretary or members of the Consulting Staff.

The Committee, in adopting the Minute of the Sub-Committee for transmission to the Board of Directors, recommended that powers be given to the Sub-Committee to work out the details and carry through the arrangements for the Scheme.

Edinburgh Highland Reel and Strathspey Society.—The Committee recommended that the grant of £50 to the Edinburgh Highland Reel and Strathspey Society be renewed for the current year.

MEETING OF DIRECTORS HELD IN THE SHOWYARD, ALLOA, 23RD JUNE 1937.

Mr J. P. ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present.—Vice-President—Provost James P. Younger. *Ordinary Directors*—Mr John D. Allan; Major R. F. Brebner; Lieut.-Colonel Garden Beauchamp Duff, D.S.O.; Mr William I. Elliot: Mr George Grant; Mr J. E. Kerr; Mr James R. Lumsden; Mr William Meiklem: Mr Alexander Murdoch; Mr James Paton; Mr John W. Prentice; Mr Charles W. Ralston; Captain Ian S. Robertson; Mr J. P. Ross-Taylor; Lord Rowallan; The Hon. Walter T. H. Scott, Master of Polwarth; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr A. A. Hagart Speirs; Mr Thomas Templeton; Colonel Robert W. Walker; Mr James Wither. *Extraordinary Directors*—Mr Walter A. Aitkenhead; Mr A. Y. Allan; Mr Ian M. Campbell; Mr John E. B. Cowper; Captain James Craig; Mr James Durno; Captain Thomas Elliot; Mr Alexander Forbes; Mr W. P. Gilmour; Mr John Hewetson; Mr James M'Laren; Mr William M'Laren; Mr Thomas M'Lay; Mr Gavin Ralston; Mr W. M'Nair Snadden; Major S. Strang Steel; Mr Duncan M. Stewart; Mr T. G. Wilson. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont. *Auditor*—Mr George James Gregor, C.A. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

Protests.

A protest was submitted, signed by Mr Robert C. Cameron, Greenlawdean, Greenlaw, and Mr Harry Findlay of Myreton, Dundee, against the award of a first prize, in the class for Border Leicester Tup above one shear, to the animal No. 902, "Sandyknowe Coronation" (11,308), belonging to Colonel E. W. S. Balfour of Balbirnie, Markinch, on the grounds that the animal's head had been treated by a substance other than ordinary dip free of added colouring matter, and that the animal's gigots had also been coloured.

On a report from the Stewards of Sheep, the small Committee appointed to advise with them, and the Society's Consulting Chemist, it was unanimously decided that the protest be not sustained. Further, as the protest was regarded as being frivolous, in the sense of the Society's Regulations, it was decided that the deposit of £2, 2s. be forfeited.

Precepts.

The Chairman was authorised to sign the Precepts for the prizes awarded at Alloa Show. Authority was given to draw upon the Society's Ordinary Funds to meet any deficit on the Show Account, and also, if necessary, to obtain an Overdraft from the Bank of a sum not exceeding £2000.

Dumfries Show—Timber Contract.

A letter was submitted from Messrs Muirhead & Sons, Ltd., Grangemouth Sawmills, Grangemouth, the Company from which the timber was hired for the Alloa Show, offering to supply the timber requirements for the Show next year at Dumfries at the rates in operation at Alloa, plus a sum of £1000. It was pointed out that, of the additional £1000, £500 would be accounted for by extra carriage to Dumfries.

It was agreed that the matter be remitted to the following Special Committee, with powers to accept, if so decided: Mr J. P. Ross-Taylor, The Earl of Home, K.T., Colonel F. J. Carruthers, Mr Alexander Murdoch, and Mr James Durno.

The Committee met subsequently, and unanimously decided that the above offer be accepted.

Eradication of Animal Diseases.

A discussion took place with regard to the Government's proposals recently published for the Eradication of Animal Diseases. The feeling was expressed that no proper consideration could be given to the Scheme without further details, and that the matter should not be rushed without proper consultation with Local Authorities and other bodies interested.

It was agreed that it be left to the following Committee to await developments and take action, if thought necessary: Major R. W. Sharpe (*Convener*), Mr J. E. Kerr, Lord Rowallan, Mr T. G. Wilson, with the Chairman, Treasurer, and Honorary Secretary, *ex officii*.

SPECIAL MEETING OF DIRECTORS HELD IN THE SHOWYARD, ALLOA, 24TH JUNE 1937.

Mr J. P. ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present.—*Ordinary Directors*—Major R. F. Brebner; Mr William I. Elliot; Mr George Grant; Mr James R. Lumsden; Mr William Meiklem; Mr William Montgomery; Mr Alexander Murdoch; Mr John W. Prentice; Mr Charles W. Ralston; Mr J. P. Ross-Taylor; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr A. A. Hagart Speirs; Mr Thomas Templeton; Mr Francis W. Walker; Mr James Wyllie. *Extraordinary Directors*—Mr Ian M. Campbell; Captain James Craig; Captain Thomas Elliot; Mr W. P. Gilmour; Mr James M'Laren; Mr W. M'Nair Snadden. *Treasurer*—The Earl of Home, K.T. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont.

Protest.

A protest was submitted, signed by Miss Margaret Brown, Westerton, Killearn, in connection with the Jumping Competition held on the evening of Wednesday, 23rd June, for Horse or Pony, any height, confined to competitors permanently resident in Scotland. A condition of the Competition was that the horse or pony must have been the property of the competitor since 1st May 1937. Miss Brown protested against the eligibility of No. 6 gelding, "Dublin," belonging to Mr Harold P. Mitchell, Tulliallan Castle, Kincardine, on the grounds of its not having been in the ownership of Mr Mitchell at 1st May 1937.

A representative of Mr Mitchell appeared before the Meeting, and admitted that the gelding in question was not the property of Mr Mitchell at 1st May.

It was decided that the protest be sustained.

Removing Sheep from Showyard.

The Steward of Sheep reported that Mr Walter S. Douglas, Upper Hindhope, Jedburgh, had removed his sheep (13 in number) from the Showyard without permission from the Steward or Secretary.

After discussion, it was decided, by 10 votes to 8, not to take any action in the matter.

MEETING OF DIRECTORS, 3RD NOVEMBER 1937.

Mr J. P. ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present. *Vice-Presidents*—Colonel F. J. Carruthers of Dormont, Lockerbie; Provost William J. Kelly, Dumfries. *Ordinary Directors*—Mr John D. Allan; Major R. F. Brebner; Mr William Brown; Mr Ian M. Campbell; Mr John E. B. Cowper; Mr Peter W. Crawford; Lieut.-Colonel Garden Beauchamp Duff, D.S.O.; Mr William I. Elliot; Mr J. E. Kerr; Mr James R. Lumsden; Mr A. W. Montgomerie; Mr William Montgomery; Mr Alexander Murdoch; Mr James Paton; Mr Charles W. Ralston; Captain Ian S. Robertson; Mr J. P. Ross-Taylor; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr A. A. Hagart Speirs; Mr Thomas Templeton; Colonel Robert W. Walker; Mr James Wither. *Extraordinary Directors*—Mr Thomas Clark; Mr James Durno; Captain Thomas Elliot; Mr W. P. Gilmour;

Mr Peter Gordon; Mr Francis N. M. Gourlay; Mr George Grant; Sir John H. Milne Home; Mr Alexander N. M'Caig; Mr James M'Connell; Mr Robert Macmillan; Mr James J. Paterson; Mr John W. Prentice; Mr Gavin Ralston; The Hon. Walter T. H. Scott, Master of Polwarth; Mr John Faed Sproat; Mr T. G. Wilson; Mr James Wyllie. *Treasurer*—The Earl of Home, K.T. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

The late Earl of Wemyss and March.

Before proceeding with the business of the Meeting, the Chairman referred, with deep regret, to the loss sustained by the Society through the death of the Earl of Wemyss and March. The Earl of Wemyss, he said, was a member of the Society for over fifty years, and filled the office of President during the year of the Edinburgh Show, 1927. As Lord Lieutenant of the County of East Lothian, and as a Member of Parliament, he devoted much of his time and outstanding ability to the public service. As a landlord he was held in the highest esteem, and his keen interest in Agriculture was apparent to any who were privileged to visit his Home Farm at Longniddry. He filled the office of President of the Society with distinction, and his loss was one which they deeply regretted.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the family of the deceased.

The late Sir Herbert E. Maxwell of Monreith, Bt.

The Chairman then referred to the death of Sir Herbert Maxwell, who, he said, had been a member of the Society for sixty years, and had filled the office of Vice-President on the occasion of the last three Shows at Dumfries—1910, 1922, and 1930.

Sir Herbert Maxwell's literary accomplishments, together with his activities in other directions, made him one of the most outstanding personalities in Scotland. His books covered a wide field of literature, embracing history, biography, natural history, politics, fiction, archæology, and many other subjects, and in all of these he wrote with artistry, knowledge, and understanding. His services to his homeland of Galloway, to his Country and to the Empire, were rendered with wholehearted devotion, and of few men to whom it had been granted to pass their ninetieth year could it be so truly said that they had died in harness.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the family of the deceased.

The late Mr James Elder, Athelstaneford Mains.

The Chairman also referred, with deep regret, to the death of a former member of the Board, Mr James Elder, Athelstaneford Mains. Mr Elder, he said, had been a member of the Society since 1890, was an Ordinary Director for four years, and an Extraordinary Director on two occasions. He was a notable figure in the agricultural life of Scotland. In addition to his business as a Seedsman, he farmed on a considerable scale, and filled many high offices connected both with the Seed Trade and with Agriculture generally. Amongst these might be mentioned the Chairmanship of the Scottish Chamber of Agriculture and of the Scottish Conference on Agricultural Policy. But perhaps his name would be best remembered through the part he took in the institution of the Scottish Society for Research in Plant-Breeding. It was on his suggestion that the Highland Society initiated the movement which led to the formation of the Plant-Breeding Society, and it was due to his untiring zeal in the cause of Plant improvement that so much of the money was raised from Scottish Farmers and Seed Growers to endow the Research Station at Corstorphine. It was fitting that Mr Elder should be elected first Chairman of the Plant-Breeding Society, and he occupied that position at the time of his death. His death was a loss to Agriculture in Scotland which they deeply deplored.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the family of the deceased.

The late Mr Charley Tinker of Kilmartin.

The Chairman further referred, with deep regret, to the death of another former member of that Board, Mr Charley Tinker of Kilmartin. Mr Tinker, he said, served as an Ordinary Director of the Society for a period of four years—from 1931 to 1934. He took a keen interest in Agriculture, being a pioneer in the drying of forage crops by artificial mean., and he was a Breeder and successful Exhibitor of Red Poll Cattle. He took a prominent part in local administrative affairs, being an active member of Inverness County Council and Chairman of the County Roads Committee. His genial personality and cheerful disposition secured for him the esteem and regard of his colleagues, and his death was a loss to the business life of Inverness-shire which would be widely regretted.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the widow of the deceased.

Chairman of the Board for 1937-38.

On the motion of Mr Alexander Murdoch, East Hallside, Cambuslang, seconded by Colonel F. J. Carruthers of Dormont, Lockerbie, Mr J. P. Ross-Taylor, Mungoswalls, Duns, was unanimously re-elected Chairman of the Board for the ensuing year.

Mr Ross-Taylor, in accepting office, thanked the Directors for the honour they had done him in re-electing him Chairman of the Board, and for the support they had extended to him during the year in which he had held office.

Alloa Show, 1937.

Accounts.—The Secretary reported that a Summary of the Accounts of the Alloa Show had that day been submitted to the Finance Committee. These Accounts showed a probable credit balance of about £4009.

List of Awards.—A list of Awards at Alloa Show was laid on the table.

Herdsmen's Pavilion.—A Report by the Organising Secretary, on the work for Herdsmen carried out by the Y.M.C.A. in the Herdsmen's Pavilion at the Show, was submitted. From this Report it appeared that the Herdsmen appreciated the value of the provision made for them in the Pavilion as being of benefit not only to the men but to the Exhibitors, as their animals were better cared for than formerly, in view of the fact that the men were content to spend their spare time in the Pavilion instead of going to the adjoining town.

The Secretary was instructed to write to the Y.M.C.A., expressing the thanks of the Directors for the valuable services which they had rendered on behalf of the Herdsmen at the Show.

Dumfries Show, 1938.

Judges.—The following were appointed a Selection Committee to draw up Panels of Judges for consideration at next Meeting: Major R. F. Brebner, Mr J. E. B. Cowper, Mr James Durno, Captain Thomas Elliot, Mr William I. Elliot, Mr W. P. Gilmour, Mr George Grant, Mr J. E. Kerr, Mr Alexander Murdoch, Mr John W. Prentice, Mr T. Mercer Sharp, Mr Thomas Templeton, with the Chairman, Treasurer, and Honorary Secretary, *ex officii.*

Forage Committee.—The following Committee was appointed to make arrangements for the supply of Forage, and report to the Board: Mr John W. Prentice (*Convener*), Mr Thomas Clark, Mr J. E. B. Cowper, Mr Peter W. Crawford, Captain Thomas Elliot, Mr J. E. Kerr, Mr James M'Laren, Mr William Meiklem, Mr James J. Paterson, Mr James Paton, Mr T. Mercer Sharp, Major R. W. Sharpe, Mr James Wyllie.

Show Contracts.—The Secretary pointed out that it would not be necessary to appoint a Show Contracts Committee on this occasion, as the contract for timber had already been arranged.

Hotel Accommodation and Catering in Showyard.—It was remitted to the Chairman of the Board, the Convener of the Shows Committee, the Convener of the Local Committee, the Steward of Catering, and the Secretary, to make the necessary arrangements.

The Secretary reported that he had visited various hotels in Dumfries, and hoped to secure sufficient accommodation for Directors and Judges.

British Women's Temperance Association.—It was agreed to grant the Dumfries Branch of the British Women's Temperance Association a free site for an unlicensed Catering Stand.

Forestry Exhibition.—It was agreed that 50 ft. of shedding be granted to the Royal Scottish Forestry Society for an Exhibition of Timber, and also a grant of £40 towards the expenses of the Exhibition.

Special Prizes.—A large number of special prizes were accepted, and votes of thanks accorded to the donors.

Judging of Clydesdales.

Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh, submitted the following Motion which appeared under his name on the Agenda:—

> "That in future four Judges be appointed to act in the Clydesdale Section, these to be allocated to the Stallion, Mare, and Gelding Classes by ballot, according to a method to be determined by the Shows Committee."

Mr Alexander Murdoch, East Hallside, Cambuslang, seconded.

Mr T. Mercer Sharp, Bardrill, Blackford, moved as an amendment that the Society return to the old system of six Judges—three for Males and Geldings, and three for Females—one man standing out each time, who would act as an Umpire if required.

The Amendment was seconded by Mr George Grant of Glenfarclas, Blacksboat.

After discussion, a vote was taken, when 20 voted for the Amendment, and 20 for the Motion. The Chairman gave his casting vote in favour of the Motion, which, accordingly, became the finding of the Meeting.

Maintenance of Hedges.

The Secretary referred to the decision of the Board in April, on the suggestion of Sir John Milne Home, that the Society do something to encourage the better management of hedges. Competitions were suggested, but, as a result of further discussion, it was felt that the first step should be to give Demonstrations by skilled workmen. The Directors in each County were invited to form a Local Committee with a view to arranging for Demonstrations in the County. Only one County, so far, had taken active steps in the matter, and that was Dumfriesshire, where, under the Chairmanship of Colonel Carruthers, a Committee had been formed, of which Mr C. J. Carruthers was Honorary Secretary. The Committee had made complete arrangements for a series of Demonstrations, the first in Eskdale on 9th November, the second in Annandale on 11th November, and the third in Nithsdale on 13th November. The work of this Committee had been valuable because a booklet had been prepared, with a foreword by Sir John Milne Home, which contained full details of the various processes, and was a ready-made guide to any other Local Committee. The work done in Dumfriesshire would greatly facilitate the arrangements for similar Demonstrations in other Counties.

The Shows Committee, at their Meeting on the preceding day, had decided to recommend that a Competition, which would be open to Farm and Estate Workers in the County of Dumfries, be held next year in connection with the Dumfries Show. Particulars would be found in the Minute of the Shows Committee which was being circulated for consideration at next Meeting.

The Chairman said they were much indebted to Colonel Carruthers and his son for taking the matter up in Dumfriesshire. They were also indebted to Sir John Milne Home for the original suggestion and for the interest he had taken in the scheme, and they hoped the idea would spread. There was no question of the value of having good hedges for shelter for stock.

Colouring of Sheep.

A letter was submitted from the Society of Border Leicester Sheep Breeders, asking if the Board would be willing to receive a Joint Deputation from that Society and the Blackface Sheep-Breeders' Association with regard to Rule 44. There was also a letter from the Cheviot Sheep Society inquiring if the Directors would be prepared to meet delegates from that Society.

The Chairman said he was sure they would welcome representations from any Society on any matter that was of interest to the industry. There would, however, not be time to receive these deputations during the week of the December Meetings, so that the question of fixing a date would require to be left over until next Meeting.

Grey Squirrels.

A letter was also submitted from the Department of Agriculture for Scotland, dated 14th July, with reference to an Order issued by the Secretary of State for Scotland, conjointly with the Minister of Agriculture and Fisheries, dealing with measures for the destruction of Grey Squirrels.

Scottish National Dictionary.

A letter applying for a grant towards the cost of publishing the Scottish National Dictionary was submitted, and was referred to the Finance Committee for consideration and report.

Education.

Proposed Junior Certificate in Agriculture.—A Minute of Meeting of Education Committee, dated 2nd November, was submitted and approved.

The Minute stated that the Committee had considered the proposals by Mr J. G. Lamb, of the Bell-Baxter Continuation School, Cupar, Fife, for an Examination for a Junior Certificate in Agriculture, based on the Syllabus of the Examination for the National Diploma in Agriculture, but with a lower standard of attainment. These proposals were considered by the National Agricultural Examination Board at a Meeting at Leeds in April, when it was decided that they be referred to the two constituent Societies for an expression of opinion.

In a letter from the Royal Agricultural Society, it was stated that the Council of that Society did not approve of the issue of a Certificate in Agriculture. The Council felt that, as County Farm Institutes and other Agricultural Education Bodies in England were now being urged by the Ministry of Agriculture to provide better instruction for farm workers and to conduct Examinations at the end of the Courses, there was really no need in England for an Examination such as Mr Lamb suggested.

After careful consideration, the Committee agreed to recommend that, before arriving at a decision on the subject, the Secretary be instructed to send a copy of Mr Lamb's proposals to the Scottish Education Department, together with the views of the Royal Agricultural Society thereon. It should be pointed out to the Department that there was at present no opportunity in Scotland for candidates to obtain Lower Grade Certificates in Agriculture of the kind referred to. There were no Farm Institutes, and the Courses at the College of Agriculture were not such as farm labourers and their sons could attend. The Department should be asked for information as to the centres in Scotland at which Continuation Classes in Agriculture, similar to those at the Bell-Baxter, were conducted, and also if the Scottish Education Department considered that there would be a demand for such a Junior Certificate. In the event of there being such a demand, it was probable that the Society would be prepared to consider the holding of such an Examination as Mr Lamb proposed and the granting of a Junior Certificate in Agriculture.

Finance.

A Minute of Meeting of Finance Committee, dated 3rd November, was submitted and approved.

The Minute dealt with the following matters:—

Staff Superannuation Scheme.—A Sub-Committee had considered the Draft Conditions of the Superannuation Scheme in consultation with the Society's Law Agents, Messrs Tods, Murray & Jamieson, W.S. As a result, certain verbal alterations had been made. The list of members of the Staff eligible to enter the Scheme had been adjusted, and the amount of the premium to be paid in each case, including the percentage thereof to be paid by the member and that to be paid by the Society.

The Society's Law Agents were still in communication with the Inland Revenue Authorities with regard to one small point—viz., the allowance of a rebate of Income Tax on contributions paid by members of the Staff in the case where, for any reason, the Policy taken was not an Endowment one, but for a Deferred Annuity. Once that point was adjusted, the Conditions would be complete.

N.D.A. Examination.—The Secretary reported that, for the first time, the financial statement of the National Agricultural Examination Board showed a profit—*i.e.*, the income from entry fees exceeded the expenses of conducting the Examination. The balance was £37, 17s. 6d., which would be shared equally between the Royal Agricultural Society and that Society.

MEETING OF DIRECTORS, 1st DECEMBER 1937.

Mr J. P. Ross-Taylor, Mungoswalls, Duns, in the Chair.

Present.—*Vice-President*—Colonel F. J. Carruthers of Dormont, Lockerbie. *Ordinary Directors*—Mr John D. Allan; Mr William Brown; Mr Ian M. Campbell; Mr John E. B. Cowper; Mr Peter W. Crawford; Lieut.-Colonel Gardon Beauchamp Duff, D.S.O.; Mr William I. Elliot; Mr Alexander Forbes; Mr R. Wemyss Honeyman; Mr J. E. Kerr; Mr James R. Lumsdon; Mr A. W. Montgomerie; Mr William Montgomery; Mr Alexander Murdoch; Mr James Paton; Mr Charles W. Ralston; Captain Ian S. Robertson; Mr J. P. Ross-Taylor; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Major S. Strang Steel; Colonel Robert W. Walker; Mr James Wither. *Extraordinary Directors*—Mr Thomas Clark; Mr James Durno; Captain Thomas Elliot; Mr W. P. Gilmour; Mr George Grant; Sir John H. Milne Home; Mr James M'Connell; Mr James J. Paterson; Mr John W. Prentice; Mr Gavin Ralston; Lord Rowallan; The Hon. Walter T. H. Scott, Master of Polwarth; Mr John Faed Sproat; Mr T. G. Wilson; Mr James Wyllie. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

Letters.

The following letters were submitted:—

Sir Aymer Maxwell, Monreith, Whauphill.—Expressing thanks for resolution of sympathy on the death of his grandfather, the late Sir Herbert E. Maxwell, Bt.

The Earl of Wemyss and March.—Thanking the Directors for their expression of sympathy on the death of his grandfather, the late Earl of Wemyss and March.

Mr James H. Elder, Creggandre, North Berwick.—Expressing appreciation of the resolution of sympathy on the death of his father, the late Mr James Elder.

Mrs Tinker, Kilmartin, Inverness.—Thanking the Board for their expression of sympathy on the death of her husband, the late Mr Charley Tinker.

The Earl of Mar and Kellie, K.T.—Expressing gratification at the success of the Alloa Show.

Provost J. P. Younger, Alloa.—Expressing gratification, on behalf of the members of the Town Council and officials, at the successful result of the Alloa Show.

Dumfries Show, 1938.

A Report of the Shows Committee, dated 2nd November, which had been printed and circulated, was submitted, considered in detail, and approved.

A Minute of Meeting of Shows Committee, dated 1st December, was submitted and approved.

The Minute dealt with the following matters:—

Buttermaking Competition.—The Sub-Committee appointed at last Meeting had now made arrangements with Messrs Lister to supply Churns, Butterworkers, and other equipment for the Buttermaking Competition. In view of this fact, it was recommended that the Buttermaking Competition be continued as last year.

Plumber Contract, &c.—The Sub-Committee appointed at last Meeting recommended that water be supplied to Exhibitors at flat rates, irrespective of position in the Showyard, according to a scale which was suggested.

Estimates had been received for painting the fronts of the Main Entrance Gates, Directors' Pavilion, and other buildings, and acceptance of one of these Tenders was recommended.

Flower Show.—The Sub-Committee appointed at last Meeting had considered various suggestions submitted by Exhibitors and by Mr A. A. Hagart Speirs, Steward of the Section, and recommended (1) that exhibits of a similar nature should not be placed side by side in allocating the Stands; (2) that the sign at the entrance to the Flower Show be so adjusted as to be seen and read from various angles; (3) that a flagpole be provided, and that the offer by the Steward to provide a suitable flag be accepted.

It was further recommended that consideration of certain suggestions regarding the offer of Certificates or Diplomas be deferred until next year.

Hunter Classes.—The Sub-Committee appointed at last Meeting recommended that the Classes for Breeding Stock be eight in number—the same as at Melrose in 1936—and that the Saddle Classes, four in number, be the same as at Alloa in 1937.

Jumping Competitions.—The same Sub-Committee recommended, with a view to limiting the number of Competitors in the Jumping Competitions, that horses, to be eligible for entry, must have won a prize of not less than £10 during the year 1937 or 1938.

Poultry Classes.—Mr J. E. Kerr and Mr James R. Lumsden reported with regard to Poultry Classes, and recommended that these be the same as at Alloa.

Convener of Local Committee.—On the motion of Mr J. P. Ross Taylor, it was unanimously agreed that Colonel F. J. Carruthers of Dormont, Lockerbie, be appointed Convener of the Local Committee of Management.

Appointment of Judges.—The Secretary reported that, at a Meeting of the Board in Committee on 30th November, Judges had been appointed for the various classes of Stock. These were being communicated with, and, after replies were received, the List of Judges would be published in the Press.

Special Prizes.—A number of Special Prizes were accepted, and votes of thanks accorded to the donors.

Show of 1939

A letter was read from the Town Clerk of Edinburgh, stating that the Lord Provost's Committee had had under consideration the question of an area of ground being made available for the Society's Show in 1939, and, at their last Meeting, resolved that the ground lying to the west of Saughton Mains Farm buildings be made available for this purpose, subject to certain arrangements being entered into between the Society and the Corporation.

The Secretary reported that he was making arrangements for a Meeting between the Sites Committee and the Lord Provost's Committee, and that the afternoon of Wednesday, the 15th December, had been proposed as a time for the Meeting. Further intimation would be sent later to the members of the Committee.

Management of Hedges.

The Secretary reported that the Demonstrations on the Management of Hedges, held during the past month in Dumfriesshire, had been well attended. There were 100 present at Evertown Farm, Canonbie, on 9th November, 113 at Dyke Farm, Dalton, on 11th November, and 127 at Holmhill, Thornhill, on 13th November—a total of 340 for the three days. In view of these attendances it was felt that the Demonstrations were entirely successful and well worth the trouble involved.

The practical work of the Demonstrations was carried out by Mr J. Robinson and Mr H. Breeze, two skilled hedgers from the Duke of Northumberland's Estate at Alnwick Castle, Northumberland. The men ably demonstrated the various methods of treating hedges so as to prolong their life and to promote new and vigorous growth. The methods shown included the cutting and laying over of a thorn hedge, and the correct methods of cutting and switching roadside or overgrown hedges. Much interest was shown in the work, and the majority of the persons attending the Demonstrations were interested spectators for several hours.

The Chairman said he thought this first series of Demonstrations had shown that the farming community were really interested, and he hoped they would have other Demonstrations in other parts of the country. On behalf of the Board of Directors, he thanked the Local Committee for the work that they had done, and he specially thanked Mr C. J. Carruthers for his valuable services as Honorary Secretary of the Local Committee in carrying through the arrangements for the Demonstrations, all of which had been done in a most efficient manner.

Colouring of Sheep.

It was decided that the deputations from the Society of Border Leicester Sheep Breeders, the Blackface Sheep Breeders' Association, and the Cheviot Sheep Society, be received by a Committee of Directors on the afternoon of Tuesday, 4th January. The Committee to meet the deputations was appointed as follows: Major R. F. Brebner, Mr Ian M. Campbell, Captain Thomas Elliot, Mr James R. Lumsden, Mr Alexander Murdoch, Mr James Paton, The Master of Polwarth, Mr G. B. Shields, Dr J. F. Tocher, with the Chairman, Treasurer, and Honorary Secretary, *ex officii*.

Scottish Association of Young Farmers' Clubs.

A letter was submitted from the Honorary Interim Secretary of the Scottish Association of Young Farmers' Clubs, inviting the Society to nominate a representative to serve on the Council of that body.

It was decided that Mr G. B. Shields, Eastfield, Clermiston Road, Corstorphine, be nominated as the Society's representative.

Inspection of Growing Crops of Potatoes.

A letter was submitted from the Department of Agriculture for Scotland, inviting representatives of the Society to attend a Conference on 23rd December to discuss the results of the operation of the Scheme for the Inspection of Growing Crops of Potatoes during the past season, and any suggestions for amendment of the Scheme in 1938.

It was decided that Mr John E. B. Cowper, Gogar House, Corstorphine, and Mr James Paton, Kirkness, Glencraig, be appointed to represent the Society at the Conference.

Land Fertility Committee.

The Chairman reported that the Land Fertility Committee held a Conference in Edinburgh on 29th November, at the Offices of the Department of Agriculture for Scotland, with representatives of Scottish Agricultural bodies and of the three Scottish Agricultural Colleges. He had attended the Conference, along with the Secretary, as representing the Society, and he gave a brief account of the discussion which took place.

Damage by Deer.

A letter was submitted from the National Farmers' Union of Scotland with regard to a Conference which they proposed to call of representatives of Associations interested in the question of Deer Legislation. Along with the letter was forwarded copy of a resolution which would be submitted by the Union at the Conference. Other matters to be discussed were (1) Eradication of Bracken, and (2) Damage to Stock on Unfenced Roads. The Society was invited to send two or three representatives to the Conference, which was to be held the following afternoon, Thursday, 2nd December, at 3 o'clock.

It was agreed that Mr Ian M. Campbell, Bal Blair, Invershin, be nominated to represent the Society at the proposed Conference.

As a result of some discussion regarding the terms of the proposed resolution, it appeared that the Directors were opposed to the suggestions (*a*) that owners of deer forests should be compelled to fence their forests with deer-proof fences where the forests adjoined arable or grazing land; and (*b*) that deer should, by law, be classified as Ground Game. The view was expressed that a satisfactory solution of the difficulty was more likely to be found by strengthening the action of voluntary Deer Control Committees in the different counties.

Finance.

A Minute of Meeting of Committee, dated 1st December, was read and approved. The Minute dealt with the following matters:—

Staff Superannuation Scheme.—Correspondence was submitted which had passed between the Society's Law Agents, the Scottish Widows' Fund, and the Inland Revenue, regarding rebate of income tax on premiums paid by members of the Staff. From this it appeared that, to secure a rebate on premiums paid for Deferred Annuity Policies, it would be necessary to alter the proposed Rules so that, in the case of Endowment Policies as well as Deferred Annuity Policies, a capital sum at the end of the period could not be taken except where there were exceptional circumstances. In view of this, the Society's Law Agents suggested that the Rules, as already adjusted, be adhered to, thus leaving the Society full discretion, in the case of Endowment Policies, as to whether a lump sum or a pension be taken at the maturity age. While this would mean that a rebate would not be allowed on premiums paid for Deferred Annuity Policies, it was felt that the amount involved in this connection was small. The Committee recommended accordingly.

Scottish Agricultural Organisation Society.—It was recommended that the grant of £100 to the Scottish Agricultural Organisation Society be renewed for the year 1938.

Staff Salaries.—The Committee recommended the following increases in the salaries of members of the Staff:—

Mr Henry Raeside, Master of Works, from £300 to £325.
Miss A. T. Maitland, Typist, from £180 to £200.
Miss C. S. Stirton, Typist, from £130 to £150.
Mr J. P. Lauder, Officer and Caretaker, from £150 to £160.

MEETING OF DIRECTORS, 5TH JANUARY 1938.

Mr J. P. ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present.—Ordinary Directors—Major R. F. Brebner; Mr William Brown; Mr John E. B. Cowper; Mr Peter W. Crawford; Lieut.-Colonel Gordon Beauchamp Duff, D.S.O.; Mr William I. Elliot; Mr Alexander Forbes; Mr J. E. Kerr; Mr James R. Lumsden; Mr James M'Laren; Mr A. W. Montgomerie; Mr William Montgomery; Mr Alexander Murdoch; Mr James Paton; Mr Charles W. Ralston; Mr J. P. Ross-Taylor; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr C. Bertram Shields; Mr John P. Sleigh; Major S. Strang Steel; Mr Thomas Templeton; Mr Francis W. Walker; Colonel Robert W. Walker; Mr James Wither. *Extraordinary Directors*—Mr Walter Biggar; Mr Thomas Clark; Mr James Durno; Mr W. P. Gilmour; Mr Peter Gordon; Mr Francis N. M. Gourlay; Mr George Grant; Sir John H. Milne Home; Mr James J. Paterson; Mr John W. Prentice; The Hon. Walter T. H. Scott, Master of Polwarth; Mr John Faed Sproat; Mr T. G. Wilson; Mr James Wyllie. *Treasurer*—The Earl of Home, K.T. *Auditor*—Mr George James Gregor, C.A. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

Congratulations to Chairman.

Mr Alexander Murdoch, East Hallside, Cambuslang, referred to the honour of Knighthood which had been conferred upon the Chairman, Mr J. P. Ross-Taylor, by His Majesty the King. He thought this was the first occasion on which a Chairman of the Society had been honoured by His Majesty during his term of office. It was a well-merited honour, and, on behalf of the Board, he extended to the Chairman their most hearty congratulations.

The Chairman, in expressing thanks, said that it had given him great gratification to receive so many good wishes and congratulations, not only from the members of that Board, but from his many friends in Scotland. It was also most gratifying to know that the industry of Agriculture had been recognised in that way. Personally, he was particularly pleased that the honour should have come to him during the period of his office as Chairman of that Board.

Dumfries Show, 1938.

Stewards.—The Principal Stewards of the various departments were appointed as follows: *Cattle*—Mr James Durno; *Horses*—Mr George Grant; *Sheep, Goats,* *and Pigs*—Mr James M'Laren; *Poultry*—Mr James R. Lumsden; *Catering, Bees, and Honey*—Mr John E. B. Cowper; *Special Events*—Mr Alexander Murdoch; *Grand Stands*—Major R. W. Sharpe; *Forage*—Mr John W. Prentice; *Gates*—Mr Ian M. Campbell; *Implements*—Mr J. P. Ross-Taylor; *Flower Show*—Mr A. A. Hagart Speirs.

Veterinary Inspector.—Mr Andrew Young, M.R.C.V.S., Dumfries, was appointed Veterinary Inspector for the Show, on the usual conditions.

Horse-Shoeing Competition.—The Secretary reported that the Local Branch of the National Master Farriers' and Blacksmiths' Association had agreed to co-operate in the Horse-Shoeing Competition. The following were appointed a Committee of Management: *Directors*—Mr John E. B. Cowper, Mr Peter W. Crawford, Mr Alexander N. M'Caig; *Local Blacksmiths*—Mr Edward Martin, Closeburn, Mr A. Hetherington, Amisfield, and Mr T. Sharpe, Dumfries, together with Mr W. P. Moodie, 77 Buccleuch Street, Dumfries, Secretary of the Local Association.

It was further decided that the following be invited to act as Judges along with the Society's Veterinary Inspector: Mr R. Hall, Chryston, Glasgow, and Mr George Marshall, Beith.

Hackneys in Harness.—At the request of an Exhibitor, it was decided to increase the number of classes for Horses in Harness to three—instead of two, as originally proposed—the classification to be the same as at Aberdeen in 1935.

Essex Pigs.—On further representations from the Essex Pig Society and various prospective Exhibitors, it was decided that the following classes be provided for these pigs, on condition that the Breed Society was prepared to contribute £10 towards the prize fund:—

Boar born in 1938	£6, £3, £1.
Sow born in 1937, on or after 1st July	£6, £3, £1.
Sow born in 1938	£6, £3, £1.

Bee Appliances and Honey.—It was decided that the limit of price for Class 3, "Best and most complete Hive, unpainted," be increased from 35s. to 37s. 6d.

Exhibit of Motor-cars.—The Secretary reported that members of the Sub-Committee appointed at the November Meeting had an interview with the Exhibition Manager of the Society of Motor Manufacturers and Traders in London during Smithfield Show week. As a result of that interview, a letter had been received from the Society stating that the matter had been further considered at a Meeting of their Management Committee, which had decided that they would, in consideration of this Society's willingness to refuse the acceptance of used private cars, issue an approval of the Society's 1938 Show for the purposes of Commercial Vehicle exhibits on the usual basis. They, however, expressed the hope that this Society might see its way, for subsequent Shows, to make a further advance towards co-operation in the policies of the Motor Industry by undertaking the exclusion of all private car exhibits, whether in new or used condition.

Hedge-Cutting Competitions.—A proof of the Prize Schedule and Entry Form for the Hedge-cutting Competitions was submitted and approved, and its issue authorised.

Live Stock Judging Competition.—It was decided that the Classes of Cattle to be judged should be Shorthorn, Galloway, and Ayrshire or British Friesian.

Dry Stone Dyking.—A letter was submitted from Colonel F. Rainsford-Hannay, Cardoness, Gatehouse-of-Fleet, offering prize-money up to £10 for a Competition in Dry Stone Dyking in the Counties of Kirkcudbright and Wigtown, provided the Society was prepared to organise such a Competition.

It was decided, in view of the fact that a new Hedging Competition was being tried out this year in Dumfriesshire, that the proposal for a Dyking Competition be not entertained in the meantime.

Special Prizes.—A number of Special Prizes were intimated, and votes of thanks accorded to the donors.

Show of 1939.

A Report by the Sites Committee was submitted and approved.

The Report stated that negotiations had taken place with the Corporation of Edinburgh regarding a site for the Show of 1939, and a Meeting had been held with a Special Sub-Committee of the Lord Provost's Committee. The site proposed to be offered by the Corporation consisted of an area of ground at Saughton, extending to about 76 acres, lying to the north of Calder Road and east of Saughton

Road North, together with an area of ground, extending to approximately 5 acres, lying to the west of Saughton Road North and attached to Old Saughton House. The total area of ground was approximately 81 acres, whereof about 55 acres might be utilised as Showground and the remainder for car parking purposes.

The offer of the site had yet to receive the confirmation of the Town Council. The Sites Committee, however, recommended that, when so confirmed, the offer of the site be accepted, it being left with the Sites Committee to adjust with the Corporation the conditions on which the site was granted, and the arrangements for services of water, gas, and electricity.

Colouring of Sheep.

The Chairman reported that the Committee appointed at last Meeting had, on the previous day, met representatives of the Border Leicester, Blackface, and Cheviot Sheep Societies, when a full discussion had taken place in a frank and friendly manner. Unfortunately, the representatives of the various Breed Societies could not put forward to the Committee any proposal other than simply that the Rule in regard to colouring be rescinded. They wanted to go back to the old position where the Exhibitor could do exactly what he liked in the matter of colouring.

After the deputation left the Meeting, the Committee had a discussion in private, and came to the conclusion, by a large majority, that they could not see their way to recommend the Directors to rescind the Rule adopted last year. They quite appreciated that there were difficulties for certain breeds, in particular the Border Leicester, because these sheep were commonly reared in proximity to industrial areas, but it was considered that the Society ought not to make an exception of one breed. The Committee had, therefore, decided to recommend that the Rule should stand, to the effect that there should be no colouring except such as was caused by ordinary dipping. They had made a slight alteration in Rule 44, which they now recommended should read as follows:—

> "The Steward of Sheep, who can call in assistance if so desired by him, shall have full power to disqualify any pen of Sheep which he considers coloured, other than by the use of ordinary non-bloom dips free of added colouring matter, or when the fleece, face or legs have been dealt with by the use of foreign substances."

There was no difference of opinion regarding the reference to face and legs. Breeders were all satisfied that the colouring of these should cease.

The Chairman then moved approval of the Committee's recommendation.

Mr Peter Gordon, Balcraig, Port William, seconded.

After a full discussion, Mr Thomas Templeton, Sandyknowe, Kelso, moved, as an amendment, that colouring of fleeces be allowed, the same as was done prior to the Show of 1937.

Mr T. Mercer Sharp, Bardrill, Blackford, seconded the amendment.

On a vote being taken, the Resolution in favour of the revised Rule was approved by twenty-one votes to eleven.

Show of 1940.

Mr Francis W. Walker of Leys, Inverness, moved the following Resolution:—

> "That, provided a suitable site is available, and satisfactory financial and other arrangements can be made, the Society's Show of 1940 be held in the Inverness Show Division."

The Motion was unanimously adopted.

Inspection of Growing Crops of Potatoes.

A Report was submitted by Mr John E. B. Cowper, Gogar House, Edinburgh, on the proceedings at a Meeting which he attended, along with Mr James Paton, Kirkness, on 23rd December, at the offices of the Department of Agriculture for Scotland, to discuss with Merchants and Growers various points arising from the inspection of growing crops of potatoes in 1937.

The Chairman, on behalf of the Board, thanked Mr Cowper and Mr Paton for what they had done in connection with this matter.

Scottish Agricultural Organisation Society.

On the motion of the Treasurer, it was unanimously agreed to confirm the proposed grant of £100 to the Scottish Agricultural Organisation Society for the year 1938.

Argyll Naval Fund.

A Minute of Meeting of Argyll Naval Fund Committee, dated 5th January, was read and approved.

The Minute stated that the following beneficiaries under the Fund had been promoted to the rank of Lieutenant, and that their grants, therefore, terminated: Lieutenant Kenneth Campbell Grieve, Lieutenant Robert Love Alexander, Lieutenant Norman Douglas Campbell, and Lieutenant David Barclay Nairne Mellis.

With these withdrawals and former and prospective vacancies, six beneficiaries could be appointed at that time. Applications had been considered from eight Candidates, and it was recommended that the following be appointed: Cadet Peter Forbes Farquhar, Cadet Christopher Henry Fothergill, Cadet Alastair Gavin Hamilton, Cadet Mungo Hamilton Macleod Kennedy, Cadet George Cunningham Leslie, and Cadet Charles Ian Reed.

Finance.

A Minute of Meeting of Finance Committee, dated 5th January, was submitted and approved.

The Minute dealt, *inter alia*, with the following matter:—

Staff Superannuation Scheme.—A letter was submitted from Messrs Tods, Murray & Jamieson, W.S., forwarding copy of the Rules of the Society's Staff Pensions Scheme, as now finally adjusted. Along with this was a letter from the Chief Inspector of Taxes, Somerset House, London, to the effect that rebate of income tax would be allowed on premiums paid by members of the Staff in respect of Endowment Assurance Policies, but no such rebate would be allowed in the case of Deferred Annuity Policies.

MEETING OF DIRECTORS, 2ND FEBRUARY 1938.

Mr J. P. ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present.—Ordinary Directors—Mr John D. Allan; Mr William Brown; Mr John E. B. Cowper; Mr Peter W. Crawford; Mr William I. Elliot; Mr James R. Lumsden; Mr James M'Laren; Mr A. W. Montgomerie; Mr William Montgomery; Mr Alexander Murdoch; Mr Charles W. Ralston; Captain Ian S. Robertson; Mr J. P. Ross-Taylor; Mr T. Mercer Sharp; Major Robert W. Sharpe; Mr G. Bertram Shields; Major S. Strang Steel; Mr Francis W. Walker. *Extraordinary Directors*—Mr Thomas Clark; Mr James Durno; Mr W. P. Gilmour; Mr Peter Gordon; Mr Francis N. M. Gourlay; Mr George Grant; Sir John H. Milne Home; Mr Alexander N. M'Caig; Mr Robert Macmillan; Mr James J. Paterson; Mr John W. Prentice; Mr Gavin Ralston, M.V.O.; Lord Rowallan; The Hon. Walter T. H. Scott, Master of Polwarth; Mr T. G. Wilson. *Treasurer*—The Earl of Home, K.T. *Chemist*—J. F. Tocher, D.Sc., LL.D., F.I.C.

Sympathy with Colonel F. J. Carruthers of Dormont.

Before proceeding with the business of the Meeting, the Chairman made sympathetic reference to the death of Mr Christopher J. Carruthers, eldest son of Colonel F. J. Carruthers, Honorary Secretary of the Society, and the Secretary was instructed to convey to Colonel Carruthers and to Mrs Carruthers an expression of the Directors' very deep sympathy with them in their great bereavement.

At the same time, the Secretary was instructed to express the Directors' sincere hope that Colonel Carruthers' health might soon be completely restored, and that he would, at an early date, be able to take his usual place at their Meetings.

Letters.

The following letters were submitted:—

Shetland Flock Book Society.—Expressing thanks for grant of £10, 10s. annually, for five years, for a Shetland Sheep Competition at Tingwall Agricultural Show.

Damage by Deer, &c.—From the National Farmers' Union of Scotland, forwarding copy of a letter from the Department of Agriculture for Scotland in reply to Resolutions on the subjects of Damage by Deer and the Eradication of Bracken, passed on 2nd December at a Joint Conference convened by the National Farmers' Union. With regard to Damage by Deer, the letter stated that Mr Elliot was actively considering the question of devising suitable legislation. With regard to Eradication of Bracken, it was pointed out that the Secretary of State was aware that machines could not be used on every type of land, and that a certain amount of hand-cutting would always be necessary. He felt, however, that an extension of the Government's Scheme beyond its present limits would be open to objections and practical difficulties, and, in any case, must be considered in close connection with the wider questions involved in the whole policy of Grassland Improvement as a means of increasing the fertility of the land.

Agricultural Unemployment Insurance.—From the Divisional Controller, Ministry of Labour, with regard to the question as to whether certain subsidiary employments in Agriculture should be brought within the scope of Agricultural Unemployment Insurance. The letter was remitted to the following small Committee to take such action as they might consider desirable: Mr Alexander Murdoch, Mr A. W. Montgomerie, with the Chairman, Treasurer, and Honorary Secretary, *ex officii.*

North of Scotland College of Agriculture.—Sending notice regarding a Farming Conference on the Improvement of Grassland and the Maintenance of Fertility, to be held under the auspices of the College on Friday, 25th February. In connection with the Conference a Dinner was to be given within Strathcona House, Bucksburn, on Thursday, 24th February, at 7.30 P.M., to which one of the Directors of the Society was invited. It was unanimously decided that Mr James Durno, Crichie, Inverurie, be nominated as the Society's representative at the Dinner.

Science.

A Minute of Meeting of Science Committee, dated 2nd February, was submitted and approved.

The Minute dealt with the following matters:—

Schedule of Unit Values.—The Schedule of Unit Prices of Manures and Feeding-Stuffs for the current year had been revised, and it was recommended that it be printed and issued as usual.

Values of Unexhausted Manures and Feeding-Stuffs.—It was recommended that the Table of Values of Unexhausted Manures and Feeding-Stuffs be re-issued, and that it be remitted to Dr Tocher, Consulting Chemist, to revise it in terms of the new Unit Values.

Dumfries Show, 1938.

Assistant Stewards.—Assistant Stewards of the various departments were appointed as follows: *Cattle*—Mr J. E. Kerr; *Horses*—Mr John P. Sleigh; *Sheep, Goats, and Pigs*—Mr William I. Elliot; *Forage*—Mr T. Mercer Sharp; *Grand Stands*—The Master of Polwarth; *Gates*—Mr Alexander Forbes and Mr James Wither; *Implements*—Mr James Paton and Captain Ian S. Robertson; *Special Events*—Appointment delayed until next Meeting.

Forage.—A Minute of Meeting of Forage Committee, dated 2nd February, was read and approved.

The Minute stated that only one Tender had been received, and the Committee recommended the acceptance of the offer by the Forage Supply Co., Ltd., Springfield Mills, Leith, to supply forage for the Show.

Essex Pigs.—It was decided to appoint Mr W. Ritchie, Marks Hall, Margaret Roding, Dunmow, Essex, as sole Judge of Essex Pigs.

Rural Industries.—It was agreed to appoint the following to act as Judges: Miss Bruce, Highland Home Industries, Edinburgh—Shetland Knitting, Tweeds, and Lace; Mr John Paterson, Drydon Place, Edinburgh—Handicrafts; Miss Angus, School of Art, Aberdeen—Embroidery.

Catering.—A Minute of Meeting of Catering Committee, dated 2nd February, was submitted and approved.

The Minute stated that various communications had been considered with regard to the Licensed Bar in the Members' Pavilion, and the Committee had decided to recommend that the provision of such a Licensed Bar be discontinued.

It was recommended that the following be added to the membership of the Committee: Mr Alexander Murdoch and Mr James Durno.

Times of Judging and Parades.—The Secretary reported that a Meeting of Stewards would take place immediately after the Board Meeting, when the times of Judging and Parades would be considered. It was agreed that powers be given to the Stewards to deal with the matter.

Proof of Prize List.—A proof of the Prize List and Regulations was submitted and approved for publication.

New Implements.—The following were appointed Judges of New Implements: Mr J. P. Ross-Taylor, Mungoswalls, Duns; Mr James Paton, Kirkness, Glencraig; and Mr John E. B. Cowper, Gogar House, Corstorphine.

Agricultural Engineers' Association.—A letter was submitted from the Agricultural Engineers' Association, asking the Board to consider increasing the open space in front of the Stands in the Machinery in Motion Section. It was decided that this space be increased from 20 ft. to 25 ft. A further suggestion that the width of the bays be 14 ft. instead of 10 ft. was considered, but it was decided to take no action until the Steward of Implements had had an opportunity of discussing the matter with Exhibitors at the Show.

Special Prizes.—A number of Special Prizes were intimated, and votes of thanks accorded to the donors.

Show of 1940.

It was decided that the following be appointed a Committee to visit and inspect available sites in the Inverness Show Division for the Show of 1940, and report: Mr James Durno, Mr George Grant, the Ordinary Directors for the Show Division, and the Chairman, Treasurer, and Honorary Secretary, *ex officii.*

Advertising of Beef and Mutton.

The Secretary reported that a letter was received from the National Farmers' Union of Scotland, dated 11th January, inviting the Society to appoint representatives to attend a Conference to be held on 26th January for the purpose of considering a proposed Scheme for the Advertising of Beef and Mutton under Part VI. of the Live Stock Industry Act, 1937.

After consultation with the Chairman of Directors, the Secretary had replied that the matter, however important, was outwith the Society's usual activities, and that they would not wish to have direct representation at the deliberations. This action was approved.

Finance.

A Minute of Meeting of Finance Committee, dated 2nd February, was submitted and approved.

The Minute dealt with the following matters:—

Scottish National Dictionary.—In accordance with the remit from the Board, the Committee had considered the application for an annual grant towards the cost of preparation and publication of the Scottish National Dictionary. They had decided that they could not see their way to recommend that a grant be given.

Spey Bay Agricultural Club.—An application from this Club for a donation to the prize fund of their Tractor Ploughing Match had been considered, but it was decided to recommend that the application be not entertained. Applications for such grants are dealt with by the Shows Committee annually, in December, for the succeeding year.

Dumfries Show—Special Events.

The Secretary explained the difficulty he was experiencing in securing a Military Display Team, or similar Special Event, for the Dumfries Show. This difficulty arose through many of the available Teams being engaged during the Show week at the Glasgow Empire Exhibition, whilst other Regiments from which teams might have been drawn were mechanised.

It was decided to appoint the following small Committee to deal with the matter: Mr Alexander Murdoch, Major Robert W. Sharpe, with the Chairman, Treasurer, and Honorary Secretary, *ex officii.*

MEETING OF DIRECTORS, 2ND MARCH 1938.

Sir JOSHUA ROSS-TAYLOR, Mungoswalls, Duns, in the Chair.

Present. *Vice President*—Colonel F. J. Carruthers of Dormont, Lockerbie. *Ordinary Directors* Mr John D. Allan; Major R. F. Brebner; Mr Ian M. Campbell; Mr John E. B. Cowper; Mr Peter W. Crawford; Lieut.-Colonel Garden Beauchamp Duff, D.S.O.; Mr William I. Elliot; Mr R. Wemyss Honeyman; Mr J. E. Kerr; Mr James M'Laren; Mr A. W. Montgomerie; Mr William Montgomery; Mr Alexander Murdoch; Mr James Paton; Captain Ian S. Robertson; Sir Joshua Ross-Taylor; Major Robert W. Sharpe; Mr G. Bertram Shields; Mr A. A. Hagart Speirs; Mr Francis W. Walker; Colonel Robert W. Walker; Mr James Wither. *Extraordinary Directors*—Mr Walter Biggar; Mr James Durno; Captain Thomas Elliot; Mr W. P. Gilmour; Mr Peter Gordon; Mr Francis N. M. Gourlay; Mr George Grant; Lord Rowallan; The Hon. Walter T. H. Scott, Master of Polwarth; Mr John Fead Sproat; Mr T. G. Wilson; Mr James Wyllie. *Treasurer*—The Earl of Home, K.T. *Honorary Secretary*—Colonel F. J. Carruthers of Dormont.

Sympathy with Chairman.

The Earl of Home referred, in sympathetic terms, to the great bereavement which the Chairman had recently suffered through the death of his younger daughter, and expressed, on behalf of the Members of the Board, their very deep sympathy with him and with Lady Ross-Taylor in the grievous loss which they had sustained.

Letters.

The following letters were submitted:—

Colonel F. J. Carruthers of Dormont.—Expressing thanks for message of sympathy on the death of his eldest son, Mr Christopher J. Carruthers, Yr., of Dormont.

Scottish Agricultural Organisation Society, Ltd.—Thanking the Directors for renewal of grant of £100 for the current year.

Royal (Dick) Veterinary College.—From Mr David Sharpe, W.S., Secretary of the Extension Fund, reporting progress with the Fund and with the extension work at the College.

Dumfries Show, 1938.

Visit of T.R.H. The Duke and Duchess of Gloucester.

A letter was read from Sir Godfrey Thomas, Private Secretary to H.R.H. the Duke of Gloucester, stating that T.R.H. The Duke and Duchess of Gloucester would be pleased to visit the Show at Dumfries on Wednesday, 22nd June. His Royal Highness would also preside at the Annual General Meeting of Members which takes place on that day at 12 noon.

The Chairman said he was sure they were all highly gratified to know that Their Royal Highnesses were to visit the Show on the Wednesday.

Catering.—A Minute of Meeting of Catering Committee, held on 2nd March, was submitted and approved.

The Minute recommended that there be three Licensed Catering Stands, instead of four, on this occasion. The size of the Stands would be increased so as to provide seating accommodation in each for about 500 persons. The Stands would be in the hands of the following:—

Royal Athenæum, Ltd., Union Street, Aberdeen.
Messrs Westcon, Ltd., 41 Mill Street, Ayr.
Mr P. T. Ferguson, The Imperial Restaurant, Dumfries.

The design of the Stands was to be altered so as to permit of quicker and more efficient service.

The official catering in the Directors' Private Luncheon Room and Lady Members' Pavilion would be in the hands of the Royal Athenæum, Ltd., Aberdeen.

Catering for the Press would again be in the hands of Messrs Westcon, Ltd., Ayr.

The Dumfries Branch of the British Women's Temperance Association would have the usual Unlicensed Refreshment Stand.

The condition that only home-fed meat shall be supplied in the catering Stands was again imposed on all the Caterers.

Hedge-Cutting Competitions.—It was decided that Major J. G. G. Rea, D.S.O., Berrington House, Ancroft, Berwick-on-Tweed, be appointed Judge of the Hedge-Cutting Competitions.

The following were appointed Attending Members in connection with the Competitions: Sir John H. Milne Home, Mr Charles W. Ralston, Mr Peter W. Crawford.

Assistant Steward.—It was decided that Major R. F. Brebner be appointed Assistant Steward of Special Events.

Horses in Harness.—On a request from Mr F. Beattie, Glasgow, it was decided to provide a class for Horses in Harness, shown in Van or Light Lorry, to be judged and exhibited on the Friday, with prize-money £8, £5, and £3.

Dumfries and Galloway Club.—A letter was submitted stating that the Committee of the Club had elected the Directors and Officials of the Society as Honorary Members of the Club while in Dumfries in connection with the Show. The Secretary was instructed to thank the Club for their courtesy in granting this privilege.

Royal Scots Greys.—The Secretary reported that after protracted negotiations there was now a good prospect of securing the Display Team and Band of the Royal Scots Greys for the Show. This arrangement had been facilitated by the courtesy of the Management of the Empire Exhibition, who had agreed that the Band engagement with the Exhibition should be altered to another date.

It was decided that the Secretary should write to Captain Graham, General Manager of the Empire Exhibition, thanking him for what he had done to facilitate this arrangement.

The Burns Mausoleum.—A letter was submitted from the Honorary Secretary of the Burns Federation requesting permission to erect a collecting box in the Showground for funds to wipe off the debt incurred in replacing the Statuary in the Burns Mausoleum, Dumfries.

It was decided that the application be not entertained, but that it be remitted to the Finance Committee to consider the question of giving a grant for this object.

S.W.R.I.—It was decided to grant a free Stand, with 60 ft. of frontage in Section 3, to the South-Western Area, S.W.R.I., and also to authorise work by the Society's Contractor on the Stand, to the value of £30, free of charge.

Dumfries and Galloway Royal Infirmary.—It was decided that a free Stand, with 10 ft. frontage in Section 4, be granted to the Dumfries and Galloway Royal Infirmary Contributors' Association for the display of literature and photographs relating to the work of the Infirmary.

The Scottish Agricultural Organisation Society, Ltd.

A letter was submitted from the Scottish Agricultural Organisation Society, Ltd., forwarding a Statement submitted by that Society to the Import Duties Advisory Committee regarding Supplies of Superphosphate of Lime to the North-Eastern Agricultural Co-operative Society, Ltd.

It was decided that the letter and Statement be remitted to the Science Committee for consideration and report.

Inspection of Growing Crops of Potatoes.

A Report was submitted by Mr James Paton, Kirkness, Glencraig, on the Meeting held on 24th January at the Offices of the Department of Agriculture for Scotland, with regard to the Scheme for the Inspection of Growing Crops of Potatoes during the season 1938. The Society was represented at the Meeting by Mr John E. B. Cowper, Gogar House, Corstorphine, and Mr Paton.

Colouring of Sheep.

A Minute of Meeting of the Special Committee on Colouring of Sheep, dated 2nd March, was submitted.

The Minute recommended that a statement be issued to the Press defining the Society's position with regard to the Colouring of Sheep. A Draft Memorandum, which had been prepared by the Secretary, was submitted, and it was recommended that it be approved and thereafter issued to the Press.

After careful consideration in detail the Memorandum was approved for publication, as follows:

Memorandum on Discolouration of Wool.

The discolouration of wool has been engaging the attention of the Directors of the Society since 1926. In February of that year a letter was received from the Skinners' Association of Scotland with regard to the discolouration of wool on Sheepskins. Later, the Scottish Wool Association wrote that they had been receiving strong protests from top-makers, spinners, manufacturers, and wool buyers with regard to the various colouring matters used by farmers in dipping their sheep, and also in preparing for the Lamb Sales and Annual Shows. The use of such colouring matters was having a very serious and damaging effect on wool, and was therefore reducing its commercial value. They mentioned that the Wool Industries Research Association and the Bradford Wool Federation were taking up the matter very strongly, and asked the Society to use its influence with its members to have colouring condemned.

In December 1928 the Directors requested Dr J. F. Tocher, the Society's Consulting Chemist, to conduct an investigation into the Bloom Dips then on the market, and to report on the nature and composition of the colouring matter present in these dips, with the object of determining whether or not the use of Bloom Dips affected the quality of the wool to an extent which rendered it advisable to discontinue their use.

As a result of the investigation it was proved that the use of colouring matter was very detrimental to wool. The colouring matter in practically all Bloom Dips was found to be an aniline dye. Experiments with various chemical reagents either failed to remove the colouring matter or, when the colouring matter was removed, the wool was destroyed or rendered unfit for commercial use. Clays, and pastes containing ochre, were also tested, and wool treated with these colouring substances was also found to be damaged, mineral particles becoming embedded in the wool and fracturing the wool fibre by mechanical action.

It was suggested that wool brokers and those engaged in the manufacture of woollen material should effect a separation of coloured from uncoloured wool. The coloured wool could be utilised for purposes different from those for which uncoloured wool was used. Those engaged in the woollen trade stated that the separation was quite impracticable from the trade point of view.

A copy of Dr Tocher's report was sent to the manufacturers of the various dips, and they were asked for their observations as to any steps which could be taken to ensure the adoption of a colouring matter which could readily be removed without damage to the wool. The replies received were to the effect that an efficient Bloom Dip could not, at that time, be manufactured without the use of dyes which were injurious to the wool.

A copy of the Report was also sent to the various Sheep Breed Societies, and a Conference between representatives of these Societies and the Science Committee was held on 16th November 1932. From the discussion which took place at the Conference it appeared that there was little prospect of inducing farmers to depart from the practice of using Bloom Dips on Rams and Lambs intended for the Autumn Sales. It was thought that the only way of dealing with the matter would be for the Wool Brokers to offer a less price for coloured wool as compared with the price of natural wool. The Directors accordingly decided to send a copy of the Report to the Skinners' Association and the Scottish Wool Association and inform them that they had come to the conclusion that nothing further could be done in the matter.

Since 1919 the Society's Show Regulations have contained a rule to the effect that the Steward of Sheep had power to disqualify any pen of Blackface, Cheviot, Border Leicester, and Half-bred sheep which he considered unnaturally coloured, or when the fleece, face, or legs had been dealt with by the use of foreign substances. In view of the foregoing considerations the Directors decided to make an alteration in the rule for the Show of 1933, the following words being added "other than ordinary dips or bloom dips." The use of bloom dips was thus permitted.

This position of affairs continued up till the Aberdeen Show of 1935, at which Show a Suffolk Shearling Ram was disqualified by the Judge on the ground that the wool had been artificially coloured. The Society's rule, above mentioned, did not apply to Suffolk Sheep, but the disqualification was made under a rule of the Suffolk Sheep Society, of which the Exhibitor was a member. That rule absolutely prohibited the use of colouring matter in any form.

Following the above incident the Directors decided that the Society's rule anent colouring be altered to include all breeds of sheep, and this alteration was made for the Melrose Show of 1936. At the same time it was decided that the various Sheep Breed Societies and Associations be invited to nominate three representatives to a Meeting to discuss, with the Directors, the whole question of discolouration of wool.

The Conference was held on 3rd December 1936. The result of the Conference was that the Breed Societies, with the exception of the Society of Border Leicester Sheep Breeders, were in favour of all colouring of sheep, other than that contained in non-bloom dips, being prohibited. The representatives of the Border Leicester Society desired that colouring, as then practised, should not be prohibited

Following this Conference the Society's rule was again amended as follows:—

> "The Steward of Sheep, who can call in assistance if so desired by him, shall have full power to disqualify any pen of Sheep which he considers coloured, or when the fleece, face, or legs have been dealt with by the use of substances other than ordinary dips free of added colouring matter."

This rule was put into operation at the Alloa Show in 1937, with the result that twenty-six sheep were disqualified.

The Border Leicester, Cheviot, and Blackface Societies thereafter requested a further Conference, and representatives of these Societies met a Committee of Directors on 4th January 1938. The representatives of these three Breed Societies were then unanimous in requesting that the rule be rescinded. After careful consideration, the Society's Committee recommended that the rule be retained, the wording being slightly altered in order to make the meaning perfectly clear. This recommendation was adopted by the Directors, by a majority, on 5th January. A suggestion that Border Leicester Sheep, which are frequently bred in proximity to industrial areas, should be made an exception, was not entertained, as it was felt that all breeds must be treated alike.

It must be borne in mind that the Highland and Agricultural Society is not concerned so much with the superficial appearance of the sheep as with its inherent good quality The aim of the Society has always been the improvement of the different breeds of farm stock. The premiums are offered for the best animals for breeding purposes, and to satisfy this requirement the animals must be such as are likely to produce the best offspring. No obstacle should be placed in the way of arriving at a correct estimate of the true quality of the animals exhibited.

Unfortunately the Council of the Society of Border Leicester Sheep Breeders has seen fit to pass a resolution recommending that Border Leicester Sheep be withheld from exhibition at Shows of the Highland and Agricultural Society until the rule referred to has been rescinded, or amended in such a way as to make it acceptable to the Border Leicester Society. This action may be considered surprising in view of the fact that the Border Leicester Society, in 1936, issued an official publication in which a description is given of a typical Border Leicester Sheep. In that description it is stated that "the whole body, above and below, should be evenly covered with *white* wool."

The main object of the Directors in prohibiting the exhibition of coloured sheep at the Show is to discourage the growing practice of colouring lambs for the Autumn Sales. Enormous losses are incurred each year through damage done by colouring, and there is no doubt that the practice is seriously reducing the commercial value of the whole wool clip and skins.

The Directors have every desire to help the sheep breeder, and at the same time to do what is best in the true interests of the industry. It is generally admitted that colouring has, in certain breeds, been greatly overdone in recent years, and they believe that nothing but good can result from a limitation of the practice. Excessive colour may not have been used to cover up defects, but it certainly is open to abuse in this way. The rule as it now stands is not exacting in its terms, and the Directors believe that if breeders will give it a fair trial, making reasonable use of the ordinary dips which are not prohibited, they will find that sheep can be shown in a condition which will be entirely satisfactory to all concerned.

PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 2ND JUNE 1937.

THE EARL OF ANCASTER, Drummond Castle, Crieff, Vice-President, in the Chair.

New Members.

Three hundred and twenty candidates were balloted for and admitted members of the Society.

Election of Director.

On the motion of Mr J. P. Ross-Taylor, Chairman of Directors, Captain Ian S. Robertson, M.C., Linkwood, Elgin, was elected an ordinary director of the Society for the Inverness Show Division, to fill the vacancy caused by the death of Mr James P. Brown, Dipple, Fochabers.

Election of Office-Bearers.

The following noblemen and gentlemen were elected office-bearers of the Society for the year 1937-38:—

President.—H.R.H. The Duke of Gloucester, K.G., K.T., G.C.V.O.

Vice-Presidents.—The Duke of Buccleuch and Queensberry, G.C.V.O., Drumlanrig Castle, Thornhill, Dumfriesshire; The Earl of Stair, K.T., D.S.O., Lochinch Castle, Stranraer; Colonel F. J. Carruthers of Dormont, Lockerbie; Provost William J. Kelly, Dumfries.

Ordinary Directors, 1934.—Mr Charles W. Ralston, Holmhill, Thornhill, Dumfriesshire; Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh; Sir Hector D. Mackenzie of Gairloch, Bt., Conan House, Conon Bridge; Mr James Paton, Kirkness, Glencraig; Mr Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire; Colonel Robert W. Walker, Culter Lodge, Milltimber, Aberdeenshire; Mr Thomas Templeton, Sandyknowe, Kelso; Mr James R. Lumsden of Arden, Dumbartonshire.

1935.—Mr G. Bertram Shields, 13 Moray Place, Edinburgh; Captain Ian S. Robertson, M.C., Linkwood, Elgin; Mr William Meiklem, Bennochy Park, Kirkcaldy; Mr A. A. Hagart Speirs of Elderslie, Houston House, Renfrewshire; Mr John P. Sleigh of St John's Wells, Fyvie; Major Robert W. Sharpe of The Park, Earlston; Mr T. Mercer Sharp, Bardrill, Blackford; Mr James Wither, Awhirk, Stranraer.

1936.—Mr Francis W. Walker of Leys, Leys Castle, Inverness; Mr John D. Allan, Culthill Implement Works, Murthly; Mr William Brown, Craigton, Bishopton; Lieut.-Colonel Garden Beauchamp Duff, D.S.O., of Hatton, Hatton Castle, Turriff; Mr J. P. Ross-Taylor, Mungoswalls, Duns; Mr J. E. Kerr of Harviestoun, Dollar; Mr William Montgomery, North Milton, Kirkcudbright; Mr William I. Elliot, Middletoun, Stow.

1937.—Mr R. Wemyss Honeyman, "Derculich," Strathtay; Mr A. W. Montgomerie, Westburn Farm, Cambuslang; Mr Alexander Forbes, Rettie, Banff; Major S. Strang Steel of Philiphaugh, Selkirk; Mr James M'Laren, Cornton, Bridge of Allan; Mr Peter W. Crawford, Dryfeholm, Lockerbie; Mr John E. B. Cowper, Gogar House, Corstorphine, Edinburgh; Mr Ian M. Campbell, Bal Blair, Invershin, Sutherland.

Extraordinary Directors.—Mr James Durno, Crichie, Inverurie; Captain Thomas Elliot, Thirlestane, Lauder; Mr Gavin Ralston, Glamis House, Glamis; Mr T. G. Wilson, Carbeth Home Farm, Balfron Station; Mr John W. Prentice, Craigrie Farm, Clackmannan; Mr James Wyllie, Tinwald Downs, Dumfries; Mr Thomas Clark, Muirtons, Perth; Lord Rowallan, Rowallan, Kilmarnock; Mr George Grant of Glenfarclas, Blacksboat; The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Show District.—Mr Walter Biggar, Grange Farm, Castle Douglas; Mr W. P. Gilmour, Balmangan, Kirkcudbright; Mr Peter Gordon, Balcraig Moor, Port William; Mr Francis N. M. Gourlay, Kirkland, Tynron, Dumfriesshire; Sir John H. Milne Home, Irvine House, Canonbie; Mr Alexander N. M'Caig, Challoch, Stranraer; Mr James M'Connell, Boreland, Whauphill; Mr Robert Macmillan of Holm of Dalquhairn, Woodlea, Moniaive; Mr James J. Paterson, Terrona, Langholm; Mr John Faed Sproat, Boreland of Anwoth, Gatehouse, Castle Douglas.

Treasurer.—The Earl of Home, K.T., The Hirsel, Coldstream.

Honorary Secretary.—Colonel F. J. Carruthers of Dormont, Lockerbie.

Special Grants.

The Earl of Home, K.T., Treasurer of the Society, moved approval of the following Special Grants which were recommended by the Board of Directors:—

(1) £500 towards the Building Extension Fund of the Royal (Dick) Veterinary College.
(2) £200, for the current year, to the Animal Diseases Research Association.
(3) £100, for the current year, to the Glasgow Veterinary College.
(4) £50, for the current year, to the Highland Reel and Strathspey Society.

Mr James R. Lumsden of Arden seconded, and the grants were approved.

Alloa Show, 1937.

Mr J. E. Kerr of Harviestoun, Convener of the Shows Committee, reported that the arrangements for the forthcoming Show at Alloa, on 22nd June and three following days, were well advanced. With favourable weather the work on the Showyard had proceeded expeditiously, and most of the buildings were in position. The Showyard covered an area of about 55 acres, and, in addition, there was ample parking accommodation for cars. There were car parks at both the east end and the west end of the ground, with direct access to the Showyard from both.

The site in Alloa Park was beautifully situated. It was level, covered with good turf, and studded with fine trees, which formed an ideal background to the Show buildings and greatly enhanced the general effect. The Town Council of Alloa, as on the occasion of the former Show there, was doing everything in its power to facilitate the arrangements and ensure the success of the Show.

With regard to entries, Cattle showed a slight increase in numbers, as compared with the Show at Melrose last year, and also the previous Show at Alloa. Horses were slightly down compared with Melrose, but the difference was more than accounted for by the very large entry of Hunters last year. Sheep were also fewer than at Melrose, but practically the same as at Alloa in 1929. Goats were fewer, but Pigs showed a gratifying increase. Entries in other sections were well maintained, the Live Stock Judging Competition having attracted 161 competitors, which was about the maximum number which could be arranged for in one day. The entries of Implements, Machinery, and Trade Exhibits were above the average, being approximately 1000 feet of stand frontage in excess of the large entry at Melrose last year.

The Flower Show would be on the same extensive scale as last year, and should again prove a source of great attraction to many visitors.

The new arrangement which was tried out last year, whereby one side of the Parade Ring was left open to the Main Square, would be repeated, this apparently having been found to be a convenient arrangement for visitors. The Refreshment and Snack Luncheon Counter for members had been rearranged so as to provide a separate tea-room and separate refreshment counter.

Besides the usual Parades of Prize Stock and Jumping Competitions, an extended programme of attractive events had been arranged for the Wednesday and Thursday afternoons and evenings and Friday afternoon. These items included full-dress Musical Rides and Trick Riding Displays by the 4th/7th Royal Dragoon Guards, Demonstrations of Sheep Dog Working, and Physical Training Displays by a Gymnastic Team from the Argyll and Sutherland Highlanders.

On the occasion of the last Show at Alloa the attendance was adversely affected by the fact that the hay harvest was in full operation during the period of the Show. The earlier date this year would avoid that contingency, and, provided good weather was experienced, there appeared to be every reason to anticipate that the Show at Alloa would be a distinct success.

Dumfries Show, 1938.

Colonel F. J. Carruthers of Dormont, Lockerbie, Honorary Secretary of the Society, reported that, as already intimated, the Show of 1938 would be held at Dumfries. The Directors had accepted an invitation to hold the Show at Rotchell Park, where it was held in 1922 and 1930. This site had been placed at the disposal of the Society through the action of Provost William J. Kelly and the Town Council of Dumfries. The ground was level, ample in extent, and convenient of access.

H.R.H. The Duke of Gloucester had graciously accepted the office of President, and the other office-bearers for the year had just been elected. The actual work of preparation for the Show would commence soon after the conclusion of the Show at Alloa.

Show of 1939.

Major R. F. Brebner, The Leuchold, Dalmeny, reported that, at the Annual Meeting in January, it was resolved that the Show of 1939 be held in the Edinburgh Show Division, provided a suitable site were available and satisfactory financial and other arrangements could be made. Negotiations were proceeding with the Corporation of Edinburgh with regard to a suitable site. These negotiations were not yet completed, but it was believed that the Directors would be able to report to next General Meeting that satisfactory arrangements had been made to hold the Show at Edinburgh in 1939.

Agricultural Education.

Colonel F. J. Carruthers, Convener of the Education Committee, reported on the 38th Annual Examination held at Leeds from 14th to 22nd April for the National Diploma in Agriculture. 208 candidates presented themselves for examination. 46 candidates were from Scotland. As a result of the Examination 48 Diplomas were awarded, 4 with Honours. Of the 208 candidates, 13 appeared for all the subjects, and 3 of these obtained the Diploma. 80 had passed certain subjects previously and were completing the Examination this year, and of these 45 obtained the Diploma. The remaining 115 presented themselves for groups of three, four, or five subjects, and of these 53 passed in the subjects for which they appeared and were entitled to appear for the remaining subjects in 1938 or 1939.

In submitting the report, Colonel Carruthers said that he thought there was a small item which might be of interest to members. Of those 115 who had presented themselves for groups, four came from the Evening Continuation Classes of the Bell-Baxter School, Cupar. It was the first time that candidates had entered from a school like that, and he was very glad to be able to say that two of those four candidates had passed, and one of them very well indeed.

Science.

Report by Chemist.

Dr J. F. Tocher, Consulting Chemist to the Society, submitted a report on the work done in his department during the past six months. The substance of Dr Tocher's report appears on pp. 248-254 of this volume.

Dr Tocher then referred to the Government's Land Fertility Scheme, under the Agriculture Act, 1937, for assisting the purchase of lime and basic slag. They were aware, he said, that farmers were to get an allowance of 50 per cent on the cost of lime sown on the farm. If he might venture to express an opinion, it was that the cost of liming of land should be wholly met from Government funds. The Government could then be able to ascertain what lime was available in the country, and be able to stabilise the price. It was regrettable that the only phosphatic fertiliser which the farmer would now be able to buy cheaply was slag. What about ground mineral phosphate and steamed bone flour? There were soils which never responded to slags, although slag had an excellent effect on heavy clay soils.

Dr Tocher said he had been making out the cost to the farmer, apart from the cost of the lime, at about 1s. 9d. to 2s. per acre.

Mr J. P. Ross-Taylor said he would like it to be clearly understood that the expression of opinion that 100 per cent of the cost of liming should be paid by the Government was a personal expression, and not the voice of the Highland Society. The Government must have some control of the lime that was used. If everyone was to get lime for nothing there would be no control whatever.

Mr M. G. Howie, Kersknowe, Kelso, asked if acid in water causing lead poisoning was of frequent occurrence.

Dr Tocher said that all over the country there were waters which were slightly acid. Their acidity was not such as could be determined in an ordinary way. These very slightly acid waters did act upon tin, copper, and lead. He did not know that there was evidence at all of tin poisoning. When copper got into the water supply they could see it in their bath, because it was coloured, and it was very disagreeable. There were certain patches in the country where they frequently got waters which dissolved lead, and they had had cases where persons were affected by lead poisoning.

Vote of Thanks.

Mr Alexander Murdoch, East Hallside, Cambuslang, moved that a hearty vote of thanks be accorded to the Earl of Ancaster for presiding. His Lordship, he said, had conducted the business in a most admirable way, and, he should say, in about record time. They were looking forward to the Alloa Show, and they were more than delighted that His Lordship had agreed to become one of their Vice-Presidents. He was sure he would help them in every way to make the Show a success.

The Earl of Ancaster, in reply, said he was very much obliged to them for their vote of thanks. The duties of the Chairman at that Meeting had been extremely light. He considered it to be a great honour to be asked to be a Vice-President this year, as he lived in the neighbourhood where the Show would be held. He hoped the Show would be a very great success and that the Society would go on prospering and be a great aid to Agriculture in the coming years.

MEETING OF MEMBERS HELD IN THE SHOWYARD, ALLOA, 23RD JUNE 1937.

THE RIGHT HON. THE EARL OF MAR AND KELLIE, K.T., President of the Society, in the Chair.

The President, in opening the proceedings, said that eight years had gone by since, in 1929, the Highland and Agricultural Society's Show had been held in those grounds. Since then the Centenary Show had been held, not without considerable birth pangs—for he had a vivid remembrance of the meeting early in 1929 to fix the locus of that Show.

Those of them who were in these grounds in 1929 would notice that there were that day more buildings in the yard, and more ground taken in, also that the entries in all classes of stock were eminently satisfactory, and there was a large increase in Implements. Moreover, the site was more accessible from the south and south-east following the opening, in October last, of the Kincardine Bridge. The bridge, he thought, had put Clackmannanshire definitely on the map, as he found that hitherto many of his English friends had never heard of Clackmannanshire, and if they had, had the vaguest notion as to its whereabouts.

He thought that the farmers who met there that day were in better heart than they were eight years ago; certainly during those eight years they had faced heroically times of depression and even of crisis. Now the Government had come forward with promises of standardised prices for oats and barley, as well as reduction in the prices of certain fertilisers and other things, which farmers, rather prone to look gift horses in the mouth, could surely not fail to welcome, if they were fulfilled.

In replying to a vote of thanks to the Town Council of Alloa at the annual meeting held in that showground in 1929, the Provost – the late Mr A. P. Moir— had said he hoped that the Highland and Agricultural Society would come again to Alloa; that wish had been fulfilled, and that day he (Lord Mar) repeated that hope, although he knew that Stirling, the neighbouring town with which they had no rivalry and nothing but friendship, would like to have a chance. In conclusion, he took the opportunity of thanking the Society for electing him President in that most important Coronation year; and that reminded him that when King George VI. with his Scottish Queen came to the capital the week after next he was sure that they would be accorded a rousing reception, not only from the agricultural community but from the whole Scottish nation.

Votes of Thanks.

Mr J. P. Ross-Taylor, Mungoswalls, Duns, Chairman of Directors, moved that a cordial vote of thanks be accorded to the Provost, Magistrates, and Town Council of Alloa for their cordial co-operation and assistance in all matters tending to promote the success of the Show. The welcome, he said, that had been extended to the Society on its former visit to Alloa had remained in the minds of the Directors ever since. When considering the question of the site for the 1937 Show, they did not forget that welcome, and had gladly accepted the invitation from the town of Alloa to come there again. The welcome had been repeated this year. The Society were extremely indebted to their President for making his beautiful park available again as the setting for the Show, and were also much indebted to the Town Council for all the interest they had taken in the event, and for their generous provision of such requirements as gas and water. In that connection, he should like to mention the names of the two officials in charge of those departments—Mr Napier and Mr Cairns. Then there was the Provost of Alloa, Captain Younger, who was a Vice-President of the Society this year. He had been very helpful and willing to take up anything that was suggested and see that it was done. They were greatly indebted to Captain Younger for his help and assistance during the year.

Major Strang Steel, Philiphaugh, Selkirk, in seconding, endorsed all that had been said by Mr Ross-Taylor. He should only like to add, he said, how much the Board of Directors had appreciated the welcome and the very close co-operation they had received from the Provost, Magistrates, and members of the Town Council of Alloa.

The motion was heartily adopted.

Provost J. P. Younger, in acknowledging, said that on behalf of the Town Council of Alloa he wished to tender his very grateful thanks for the generous resolution of which they had just approved. When the Town Council knew that the Society intended to hold their Show in the Stirling Division this year they were naturally very anxious to do everything possible to induce the Society to come to Alloa again. He was glad to think that their efforts to persuade the Society were successful and that Alloa had again the honour of housing the Society's Show in 1937. Anything that the Town Council did was gladly done. Any other local authority would have done no more or no less, because they did feel it was an honour to house the Society's Show. The officials who had been mentioned were equally glad to give every assistance they could, and he hoped the weather would continue in the same genial mood until Friday night at any rate. It was only right and proper for him to say that had it not been for the public-spirited action of Lord Mar they could not have held the Highland Show in Alloa, for the very simple reason that there was no other ground available to house a Show of that size.

Major R. F. Brebner, The Leuchold, Dalmeny, moved that a vote of thanks be accorded to Mr James R. Lumsden of Arden, the Convener, and to the members of the Local Committee of Management for the efficient and successful manner in which they had carried out the arrangements for the Show. They had heard, he said, about the very great importance of the site and the co-operation of the local Council, but the Directors of the Society would be quite unable to carry on the Show without an efficient and energetic Local Committee. In that respect they had been particularly fortunate this year in their Local Committee. He thought the Directors made a very wise move when they chose Mr Lumsden to be Convener of that Committee. He was a very enthusiastic Director of the Society and very enthusiastic in anything he took up. It was quite evident that he had passed on that enthusiasm to the Local Committee, because they had discharged their duties in a most efficient and thorough manner.

Mr James Paton, Kilkneuk, Glencraig, seconded, and the motion was unanimously adopted.

Mr Lumsden, in reply, said the Local Committee considered it a great pleasure to do whatever they could to help on the Show and to have any small part in furthering the success of what had been, up to date, a record Show in this Coronation year. The work of the Local Committee had been all but completed. Some members had still duties to carry out in the remaining days of the Show, but the principal work had been done on the Tuesday, the judging day. He agreed with the proposer of the resolution that the members of the Committee worked hard and well. He could assure the members that the next time the Show came to the Stirling Show Division there would be no lack of members willing and anxious to help as members of the Local Committee.

Mr Alexander Murdoch, East Hallside, Cambuslang, moved the following resolution: "That the Society express its appreciation of the satisfactory arrangements made by the Railway Companies for the expeditious transport of live stock, implements, and visitors to the Show." He was not quite sure, he said, that that resolution was in correct form, because the Railway Companies did not nowadays take all the stock, implements, &c., to the Show, and he thought it should include all the Transport Companies and probably there might be added the Airways. So far as he had heard there had been no complaint about the way in which the Railway and various Transport Companies had brought the stock to the Show, and they were all agreed that without these Companies they could never have a Highland Show like that one, and it therefore gave him great pleasure to move the resolution.

Mr W. P. Gilmour, Balmangan, Kirkcudbright, seconded, and the resolution was cordially passed.

Mr A. E. Sewell, Goods Manager, L. & N.E. Railway, Glasgow, replied on behalf of both Railway Companies, remarking that the Companies were glad of the opportunity which the Highland Show afforded them of doing something out of the ordinary. These Shows were for the national good, and the Companies realised that what was for the national good was for their own good. As indicating the great amount of work which the Show transport arrangements involved, he mentioned that last year at the Melrose Show the Companies brought to the showground 750 truck-loads of implements and live stock, and they had brought to Alloa on the present occasion 778 waggon-loads, so that, in spite of the opening of the Kincardine Bridge, the railways in the matter of transport to the Show had done rather better this year than they did a year ago.

Mr Sewell recalled also that the Companies had to undertake a heavy task in removing the stock after the Melrose Show, much of it being wanted for the Royal Show in England. Throughout the whole night they carried to the station enough live stock to enable them to send away a special train every hour, and that without interfering with the running of the ordinary night expresses over the line.

The Earl of Home, in moving a vote of thanks to the President, said they had to thank Lord Mar not only for his kindness in giving that beautiful park twice in eight years, but also for the extremely friendly and kindly manner in which he had managed that Meeting. They were very grateful to Lord Mar and they thanked him very much.

The Earl of Mar and Kellie briefly acknowledged.

ANNIVERSARY GENERAL MEETING, 5TH JANUARY 1938.

The EARL OF HOME, K.T., Treasurer, in the Chair.

THE Chairman congratulated Mr J. P. Ross-Taylor on the honour of Knighthood conferred upon him by His Majesty the King.

Mr Ross-Taylor briefly acknowledged, observing that he was particularly pleased that it should have come in the year he had the honour of being Chairman of the Board of Directors of the Society.

Annual Report.

Mr J. P. Ross-Taylor submitted the Annual Report by the Directors of the Society, copies of which had been circulated. The Report stated that the membership of the Society at the beginning of 1937 was 9757. During the year there were lost, through death, resignation, and other causes, 475 members. New members elected during the year numbered 456 (136 in January and 320 in June), thus bringing the total membership at the date of the Report to 9738. Mr Ross-Taylor made sympathetic reference to the long list of losses by death which the Society had sustained losses of eminent men well known in the life of Scotland.

With regard to the Alloa Show, he said they would have seen the financial result of that Show. From first to last the Show was a great success. They were favoured with good weather. Everything went well, and the public in general supported them splendidly. They had good exhibits of live-stock, and the entry of implements was the largest seen at the Show for a good many years. The implement manufacturers were all very pleased at their week's work. Many were entirely sold out.

He hoped the forthcoming Show at Dumfries would prove as successful. The arrangements for it were now well advanced, and they were looking forward to the event. As to the 1939 Show, arrangements, he said, had been carried a stage further since the Report was printed. The members of the Board had met the Lord Provost's Committee of Edinburgh Town Council, and a recommendation had been sent forward to the Town Council which met with the approval of the Directors.

An unusual step had been taken in the past year in connection with the maintenance of hedges. As previously reported, demonstrations had been held in Dumfriesshire, and competitions were to follow in the spring. The demonstrations had shown how a hedge really ought to be looked after. After all, a hedge was the best fence they could have, not only from the point of view of utility, but from the point of view of beautifying the countryside. A debt was due to Mr C. J. Carruthers, son of Colonel F. J. Carruthers of Dormont, Lockerbie, for having taken up that matter of hedge maintenance so enthusiastically.

Then there was the further question which arose at the Alloa Show with regard to the colouring of sheep. A Committee of the Directors met a deputation from three Sheep Breed Societies, and after taking everything into consideration the Directors had confirmed the stand they took up last year that they could not see their way to approve of the colouring of sheep at the Show. Of course, sheep must be dipped, but where there was an application of bloom dip or some foreign substance any sheep sent to the showground would certainly be disqualified.

Mr Ross-Taylor then moved the adoption of the Report.

Mr James R. Lumsden of Arden, Dumbartonshire, in seconding, said it was gratifying to them in the Stirling Show district that the Alloa Show was such an outstanding success, and they looked forward to other districts coming up to that standard.

The Report was adopted.

Election of Members.

The Secretary submitted a list of 145 Candidates for election to membership. These were balloted for and duly elected.

Annual Accounts and Special Grants.

The Chairman, the Earl of Home, K.T., Treasurer of the Society, submitted the Accounts for the year ended 30th November 1937, an Abstract of which, he said, was in their hands. Receipts, excluding receipts from Life Subscriptions, amounted to £29,422, 5s. 6d., while the payments amounted to £27,110, 16s. 5d. During the year a sum of £1047, 7s. was given in Special Grants, in addition to £1025, 19s. 11d. as Grants to Local Societies and the cost of Medals and Long Service Certificates. The Accounts showed a surplus of £2311, 9s. 1d., solely accounted for by the success of the Alloa Show.

If the receipts from Life Subscriptions were brought in, the balance of receipts over payments for the year would amount to £3533, 3s. 1d.

He formally moved the adoption of the Accounts and the approval of the following Special Grants: (*a*) £100 to the Scottish Agricultural Organisation Society for the year 1938; (*b*) £10 to the Scottish Society for the Prevention of Cruelty to Animals.

Mr John E. B. Cowper, Gogar House, Corstorphine, seconded, and the Accounts were adopted and the Special Grants approved.

Argyll Naval Fund.

Lieut.-Colonel Gardon B. Duff, D.S.O., of Hatton submitted a Report on the Argyll Naval Fund for the past year. The capital of the Fund, he said, now amounted to approximately £10,000. The income for the year 1937 amounted to £331, 7s. 5d., whilst expenditure was £169, 1s. 3d., comprising grants of £40 each to three Naval Cadets, £20 each to two Naval Cadets, and £9, 1s. 3d. in respect of advertising and printing charges. At a meeting held that day further appointments were made under the Fund, and for the current year nine cadets would be provided with grants towards the expenses of their naval education and maintenance.

Grants to Local Societies.

Mr James Wylie, Tinwald Downs, Dumfries, Convener of the Shows Committee, submitted the Report on Grants to Local Societies, and the Report was approved.

Show of 1940.

Mr Francis W. Walker of Leys, Leys Castle, Inverness, moved: "That, provided a suitable site is available, and satisfactory financial and other arrangements can be made, the Society's Show of 1940 be held in the Inverness Show Division." In submitting the motion, Mr Walker said that if the Inverness Division could not hope to set up a record in attendance they would endeavour to create a record in welcome and hospitality.

Mr Charles W. Ralston, Holmhill, seconded, and the motion was adopted.

Chemist's Report.

Dr J. F. Tocher, Consulting Chemist to the Society, submitted a Report on the work done in his department during the past half-year. The substance of the Report appears on pp. 248-254 of this volume.

Vote of Thanks.

On the motion of Mr Alexander Murdoch, East Hallside, Cambuslang, a vote of thanks was accorded to the Earl of Home for presiding.

APPENDIX

PREMIUM BOOK

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

1938

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Address for communications:

JOHN STIRTON, Secretary,
The Highland and Agricultural Society of Scotland,
8 Eglinton Crescent,
Edinburgh 12.

Telephone: 23655. *Telegraphic Address:* **"Society, Edinburgh."**

GENERAL NOTICE.

The Highland Society was instituted in the year 1784, and incorporated by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have since been continuously directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to The Highland and Agricultural Society of Scotland.

The Society avoids questions of political controversy, but in other public matters of practical concern to agriculture it seeks to guard and promote, by every means in its power, the welfare of all interested in the agriculture of Scotland.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of Great Britain, Northern Ireland, and Eire (Irish Free State) are allowed to compete.

2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Societies and Associations.

3. A scheme of Awards to Farm Workers for long and approved service in Scotland.

4. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising the Society to grant Diplomas to Students of Agriculture; and by giving grants in aid of education in Agriculture and allied sciences. In 1900 the Society discontinued its own Examination, and instituted jointly with the Royal Agricultural Society of England an Examination for a National Diploma in Agriculture.

5. The institution of an Examination for a National Diploma in Dairying, jointly with the Royal Agricultural Society of England and the British Dairy Farmers' Association.

6. The institution of an Examination in Forestry for First and Second Class Certificates. Terminated in 1935 in accordance with arrangements made with the Royal Scottish Forestry Society.

7. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise. Terminated in 1881 in accordance with arrangements made with the Royal College of Veterinary Surgeons.

8. The appointment of a Chemist for the purpose of promoting the application of science to agriculture.

9. The establishment of a Botanical Department.

10. The appointment of an Entomologist to advise members regarding insect pests, &c.

11. The annual publication of the 'Transactions,' comprehending papers by selected writers, Prize Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.

12. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society), to assist young natives of the Highlands who enter His Majesty's Navy.

CONSTITUTION AND MANAGEMENT.

The general business of The Highland and Agricultural Society of Scotland is conducted under the sanction and control of the Royal Charters, referred to above, which authorise the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty-two Ordinary and Twenty Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Supplementary Charter of 1856 provides for the appointment of a Council on Education, consisting of Sixteen Members—Nine nominated by the Charter and Seven elected by the Society.

STATEMENT OF PRIVILEGES OF MEMBERS.

MEMBERS OF THE SOCIETY ARE ENTITLED—

1. *To receive a free copy of the 'Transactions' annually.*
2. *To apply for District Premiums that may be offered, and for Long Service Awards for Agricultural Employees.*
3. *To report Ploughing Matches for Medals that may be offered.*
4. *To Free Admission to the Shows of the Society.*
5. *To exhibit Live Stock and Implements at reduced rates.*

   Firms are not admitted as Members; but if one partner of a firm becomes a Member the firm is allowed to exhibit at Members' rates.

6. *To have Fertilisers and Feeding Stuffs, &c., analysed at reduced fees.*
7. *To obtain Reports on the Animal Enemies of Crop Plants and Live Stock (including Poultry).*
8. *To attend and vote at General Meetings of the Society.*
9. *To vote for the Election of Directors.*

&c., &c.

ANALYSES OF FERTILISERS AND FEEDING-STUFFS, &c.

The scale of Fees in respect of Analyses made by the Society's Chemist for Members of the Society will be found under "Chemical Department."

Valuations of manures, according to the Society's scale of units, will be supplied on application being made.

For further particulars, see under Chemical Department.

Chemist.—Mr J. F. TOCHER, D.Sc., LL.D , F.I.C., Crown Mansions, 41½ Union Street, Aberdeen.

REPORTS ON THE ANIMAL ENEMIES OF CROP PLANTS AND LIVE STOCK (INCLUDING POULTRY).

The Consulting Zoologist is prepared to send to any Member of the Society a Report on damage to or diseases of plants and animals due to animal agency (Insects, Mites, Worms, Snails, Slugs, Birds, and the Smaller Mammals).

For further particulars, see under Entomological Department.

Consulting Zoologist.—Mr A. E. CAMERON, M.A., D.Sc., Department of Agricultural and Forest Zoology, University of Edinburgh, 10 George Square, Edinburgh.

TERMS OF MEMBERSHIP, &c.

The influence and usefulness of the Society depend mainly upon its strength in membership. The Members, through the Directors whom they elect, have the practical control of the affairs of the Society. The stronger the body of Members, the greater will be the usefulness of the Society. It will therefore be to both their own and the public advantage if all who are interested in agriculture, and who are not already enrolled, should at once become Members of the Society.

ELECTION OF MEMBERS.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the proposer should attend the Meeting.

RATES OF SUBSCRIPTION.

Higher Subscription.

The ordinary annual subscription is £1, 3s. 6d., and the ordinary subscription for life-membership is £12, 12s.; or after ten annual payments have been made, £7, 7s.

Lower Subscription.

Proprietors farming the whole of their own lands, whose rental on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Secretaries or Treasurers of Local Agricultural Associations, Factors resident on Estates, Land Stewards, Foresters, Agricultural Implement Makers, Grain, Seed and Manure Merchants, Agricultural Auctioneers, Cattle Dealers and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, and such other persons as, in respect of their official or other connection with agriculture, the Board of Directors may consider eligible, are admitted on a subscription of 10s. annually, which may be redeemed by one payment of £7, 7s., and after eight annual payments of 10s. have been made, a Life Subscription may be purchased for £5, 5s., and after twelve such payments, for £3, 3s.

It must be stated, on behalf of Candidates claiming to be admitted at the Lower Rate of Subscription (10s.), under which of the above designations they are entitled to be admitted at the Lower Rate.

Subscriptions are payable on election, and afterwards annually in January.

According to the Charter, a Member who shall not have objected to his election, on the same being intimated to him by the Secretary, cannot retire until he has paid, in annual subscriptions or otherwise, an amount equivalent to a life composition.

Members are requested to send to the Secretary the names and addresses of Candidates proposed for admission to the Society, at the same time stating whether the Candidates should be admitted at the £1, 3s. 6d. or 10s. rate.

Patron of the Society -HIS MAJESTY THE KING.

OFFICERS AND DIRECTORS FOR 1937-1938.

President.

H.R.H. The Duke of Gloucester, K.G., K.T., &c

Vice-Presidents.

The Duke of Buccleuch and Queensberry, G.C.V.O., Drumlanrig Castle, Thornhill, Dumfriesshire.
The Earl of Stair, K.T., D.S.O., Lochinch Castle, Stranraer.
Colonel F. J. Carruthers of Dormont, Lockerbie
Provost William J. Kelly, Dumfries

Ordinary Directors.

Year of Election.	
1934	Charles W. Ralston, Holmhill, Thornhill, Dumfriesshire.
	Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh.
	Sir Hector D. Mackenzie of Gairloch, Bt., Conan House, Conon Bridge.
	James Paton, Kirkness, Glencraig.
	Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
	Colonel Robert W. Walker, Culter Lodge, Milltimber, Aberdeenshire.
	Thomas Templeton, Sandyknowe, Kelso.
	James R. Lumsden of Arden, Dumbartonshire.
1935	G. Bertram Shields, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
	Captain Ian S. Robertson, Linkwood, Elgin (*elected 2nd June* 1937).
	William Meiklem, Bennochy Park, Kirkcaldy.
	A. A. Hagart Speirs of Elderslie, Houston House, Renfrewshire.
	John P. Sleigh of St John's Wells, Fyvie.
	Major Robert W. Sharpe of The Park, Earlston.
	T. Mercer Sharp, Bardrill, Blackford.
	James Wither, Awhirk, Stranraer.
1936	Francis W. Walker of Leys, Leys Castle, Inverness.
	John D. Allan, Culthill Implement Works, Murthly.
	William Brown, Craigton, Bishopton.
	Lieut.-Colonel Garden Beauchamp Duff, D.S.O., of Hatton, Hatton Castle, Turriff.
	Sir Joshua Ross-Taylor, Mungoswalls, Duns.
	J. E. Kerr of Harviestoun, Dollar.
	William Montgomery, North Milton, Kirkcudbright.
	William I. Elliot, Middletoun, Stow.
1937	R. Wemyss Honeyman, Derculich, Strathtay, Perthshire.
	A. W. Montgomerie, Westburn Farm, Cambuslang, Lanarkshire.
	Alexander Forbes, Rettie, Banff.
	Major S. Strang Steel of Philiphaugh, Selkirk.
	James M'Laren, Cornton, Bridge of Allan.
	Peter W. Crawford, Dryfeholm, Lockerbie.
	John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.
	Ian M. Campbell, Bal Blair, Invershin.

Extraordinary Directors.

Year of Election.	
1936	James Durno, Crichie, Inverurie.
	Captain Thomas Elliot, Thirlestane, Lauder.
	Gavin Ralston, M.V.O., Glamis House, Glamis.
	T. G. Wilson, Carbeth Home Farm, Balfron Station.
1937	John W. Prentice, Craigrie Farm, Clackmannan.
	James Wyllie, Tinwald Downs, Dumfries.
	Thomas Clark, Muirtons, Perth.
	Lord Rowallan, Rowallan, Kilmarnock.
	George Grant of Glenfarclas, Blacksboat.
	The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Show Division Directors.

1937	Walter Biggar, Grange Farm, Castle Douglas.
	W. P. Gilmour, Balmangan, Kirkcudbright.
	Peter Gordon, Balcraig Moor, Port William.
	Francis N. M. Gourlay, Kirkland, Tynron, Dumfriesshire.
	Sir John H. Milne Home, Irvine House, Canonbie.
	Alexander N. M'Caig, Challoch, Stranraer.
	James M'Connell, Boreland, Whauphill, Wigtownshire.
	Robert Macmillan of Holm of Dalquhairn, Woodlea, Moniaive, Dumfriesshire.
	James J. Paterson, Terrona, Langholm, Dumfriesshire.
	John Faed Sproat, Boreland of Anwoth, Gatehouse, Castle Douglas.

Chief Officials, &c.

The Earl of Home, K.T., The Hirsel, Coldstream, *Treasurer*.
Colonel F. J. Carruthers of Dormont, Lockerbie, *Honorary Secretary*.
John Stirton, 8 Eglinton Crescent, Edinburgh, *Secretary*.
Thomas W. Russell, *Chief Clerk*.
John Watt, *Second Clerk*.
George James Gregor, C.A., 8 York Place, Edinburgh, *Auditor*.
J. F. Tocher, D.Sc., LL.D., F.I.C., 41½ Union Street, Aberdeen, *Chemist*.
Henry Raeside, 8 Eglinton Crescent, Edinburgh, *Master of Works*.
A. E. Cameron, M.A., D.Sc., University of Edinburgh, 10 George Square, Edinburgh, *Consulting Zoologist*.
The Very Rev. Charles L. Warr, D.D., 63 Northumberland Street, Edinburgh, *Chaplain*.
Tods, Murray, & Jamieson, W.S., 66 Queen Street, Edinburgh, *Law Agents*.
William Blackwood & Sons Ltd., 45 George Street, Edinburgh, *Publishers*.
Hamilton & Inches, Princes Street, Edinburgh, *Silversmiths*.
Alexander Kirkwood & Son, 9 St James' Square, Edinburgh, *Medallists*.
John Menzies & Co. Ltd., 6 Castle Street, Edinburgh, *Advertising Agents*,
John Reid, 55 Blenheim Place, Aberdeen, *Showyard Erector*.
J. P. Lauder, *Officer and Caretaker*.

Chairman of Board of Directors.

Sir Joshua Ross-Taylor, Mungoswalls, Duns.

Chairmen of Committees.

1. *Argyll Naval Fund*	Maclachlan of Maclachlan, Castle Lachlan, Strathlachlan.
2. *Finance, Chambers, and Law*	The Earl of Home, K.T., The Hirsel, Coldstream.
3. *Publications*	Colonel F. J. Carruthers of Dormont, Lockerbie.
4. *Shows*	James Wyllie, Tinwald Downs, Dumfries.
5. *Implements and Machinery*	Sir Joshua Ross-Taylor, Mungoswalls, Duns.
6. *Science*	Major Robert W. Sharpe of The Park, Earlston.
7. *General Purposes*	Sir Joshua Ross-Taylor, Mungoswalls, Duns
8. *Education*	Colonel F. J. Carruthers of Dormont, Lockerbie.
9. *Office-Bearers*	Sir Joshua Ross-Taylor, Mungoswalls, Duns.

COMMITTEES FOR 1937-1938

1. ARGYLL NAVAL FUND.

Maclachlan of Maclachlan, Castle Lachlan, Strathlachlan, *Convener.*
Lieut.-Colonel Garden Beauchamp Duff, D.S.O., of Hatton, Hatton Castle, Turriff.
The Earl of Elgin and Kincardine, K.T., C.M.G., Broomhall, Dunfermline.
Sir John Gilmour, Bt., P.C., D.S.O., M.P., of Montrave, Leven.
J. E. Kerr of Harviestoun, Dollar.
James R. Lumsden of Arden, Dumbartonshire.
Sir Hector D. Mackenzie of Gairloch, Bt., Conan House, Conon Bridge.
James M'Laren, Cornton, Bridge of Allan.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
Sir Hugh Shaw-Stewart, Bt., K.C.B., Ardgowan, Inverkip.
Sir Joshua Ross-Taylor, Mungoswalls, Duns, Chairman of Board of Directors, *ex officio.*
The Earl of Home, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*
Colonel F. J. Carruthers of Dormont, Lockerbie, Honorary Secretary, *ex officio.*

2. FINANCE, CHAMBERS, AND LAW.

The Earl of Home, K.T., The Hirsel, Coldstream, Treasurer, *Convener.*
John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.
James Durno, Crichie, Inverurie.
George Grant of Glenfarclas, Blacksboat.
William C. Hunter of Arngask, Glenfarg.
J. E. Kerr of Harviestoun, Dollar.
James R. Lumsden of Arden, Dumbartonshire.
James M'Laren, Cornton, Bridge of Allan.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
James Paton, Kirkness, Glencraig.
Sir Joshua Ross-Taylor, Mungoswalls, Duns.
Major Robert W. Sharpe of The Park, Earlston.
T. G. Wilson, Carbeth Home Farm, Balfron Station.
Colonel F. J. Carruthers of Dormont, Lockerbie, Honorary Secretary, *ex officio.*
George James Gregor, C.A., Auditor, *ex officio.*

3. PUBLICATIONS.

Colonel F. J. **Carruthers** of Dormont, Lockerbie, Honorary Secretary, *Convener.*
Major R. F. **Brebner**, The Leuchold, Dalmeny House, Edinburgh.
John E. B. **Cowper**, Gogar House, Corstorphine, Edinburgh.
James Durno, Crichie, Inverurie.
Alexander Forbes, Rettie, Banff.
George Grant of Glenfarclas, Blacksboat.
Sir **John** H. **Milne Home**, Irvine House, Canonbie.
J. E. **Kerr** of Harviestoun, Dollar.
James R. **Lumsden** of Arden, Dumbartonshire.
James M'Laren, Cornton, Bridge of Allan.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
James Paton, Kirkness, Glencraig.
Sir **Joshua Ross-Taylor**, Mungoswalls, Duns.
Lord Rowallan, Rowallan, Kilmarnock.
The Hon. **Walter** T. H. **Scott**, Master of Polwarth, Harden, Hawick.
T. G. **Wilson**, Carbeth Home Farm, Balfron Station.
The **Earl of Home**, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*

4. SHOWS.

James Wyllie, Tinwald Downs, Dumfries, *Convener.*
John E. B. **Cowper**, Gogar House, Corstorphine, Edinburgh, *Vice-Convener.*
John D. **Allan**, Culthill Implement Works, Murthly.
Walter Biggar, Grange Farm, Castle Douglas.
Major R. F. **Brebner**, The Leuchold, Dalmeny House, Edinburgh.
William Brown, Craigton, Bishopton.
Ian M. **Campbell**, Bal Blair, Invershin.
Thomas Clark, Muirtons, Perth.
Peter W. **Crawford**, Dryfeholm, Lockerbie.
Lieut.-Colonel **Garden Beauchamp Duff**, D.S.O., of Hatton, Hatton Castle, Turriff.
James Durno, Crichie, Inverurie.
Captain **Thomas Elliot**, Thirlestane, Lauder.
William I. **Elliot**, Middletoun, Stow.
Alexander Forbes, Rettie, Banff.
W. P. **Gilmour**, Balmangan, Kirkcudbright.
Peter Gordon, Balcraig Moor, Port William.
Francis N. M. **Gourlay**, Kirkland, Tynron, Dumfriesshire.
George Grant of Glenfarclas, Blacksboat.
Sir **John** H. **Milne Home**, Irvine House, Canonbie.
R. **Wemyss Honeyman**, Derculich, Strathtay, Perthshire.
J. E. **Kerr** of Harviestoun, Dollar.
James R. **Lumsden** of Arden, Dumbartonshire.
Alexander N. **M'Caig**, Challoch, Stranraer.
James M'Connell, Boreland, Whauphill, Wigtownshire.
Sir **Hector** D. **Mackenzie** of Gairloch, Bt., Conan House, Conon Bridge.
James M'Laren, Cornton, Bridge of Allan.
Robert Macmillan of Holm of Dalquhairn, Woodlea, Moniaive, Dumfriesshire.
William Meiklem, Bennochy Park, Kirkcaldy.
A. W. **Montgomerie**, Westburn Farm, Cambuslang, Lanarkshire.
William Montgomery, North Milton, Kirkcudbright.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
James J. **Paterson**, Terrona, Langholm, Dumfriesshire.

James Paton, Kirkness, Glencraig.
John W. Prentice, Craigrie Farm, Clackmannan.
Charles W. Ralston, Holmhill, Thornhill, Dumfriesshire.
Gavin Ralston, M.V.O., Glamis House, Glamis.
Captain Ian S. Robertson, Linkwood, Elgin.
Sir Joshua Ross-Taylor, Mungoswalls, Duns.
Lord Rowallan, Rowallan, Kilmarnock.
The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.
T. Mercer Sharp, Bardrill, Blackford.
Major Robert W. Sharpe of The Park, Earlston.
G. Bertram Shields, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
John P. Sleigh of St John's Wells, Fyvie.
A. A. Hagart Speirs of Elderslie, Houston House, Renfrewshire.
John Faed Sproat, Boreland of Anwoth, Gatehouse, Castle Douglas.
Major S. Strang Steel of Philiphaugh, Selkirk.
Thomas Templeton, Sandyknowe, Kelso.
Francis W. Walker of Leys, Leys Castle, Inverness.
Colonel Robert W. Walker, Culter Lodge, Milltimber, Aberdeenshire.
T. G. Wilson, Carbeth Home Farm, Balfron Station.
James Wither, Awhirk, Stranraer.
The Earl of Home, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*
Colonel F. J. Carruthers of Dormont, Lockerbie, Honorary Secretary, *ex officio.*

5. IMPLEMENTS AND MACHINERY.

Sir Joshua Ross-Taylor, Mungoswalls, Duns, Chairman of Board of Directors, *Convener.*
James Paton, Kirkness, Glencraig, *Vice-Convener.*
John D. Allan, Culthill Implement Works, Murthly.
Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh.
Thomas Clark, Muirtons, Perth.
John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.
Peter W. Crawford, Dryfeholm, Lockerbie.
Lieut.-Colonel Garden Beauchamp Duff, D.S.O., of Hatton, Hatton Castle, Turriff.
Alexander Forbes, Rettie, Banff.
W. P. Gilmour, Balmangan, Kirkcudbright.
J. E. Kerr of Harviestoun, Dollar.
Alexander N. M'Caig, Challoch, Stranraer
James M'Connell, Boreland, Whauphill, Wigtownshire.
James M'Laren, Cornton, Bridge of Allan.
A. W. Montgomerie, Westburn Farm, Cambuslang, Lanarkshire.
William Montgomery, North Milton, Kirkcudbright.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
John W. Prentice, Craigrie Farm, Clackmannan.
Charles W. Ralston, Holmhill, Thornhill, Dumfriesshire.
Captain Ian S. Robertson, Linkwood, Elgin.
The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.
T. Mercer Sharp, Bardrill, Blackford.
Major Robert W. Sharpe of The Park, Earlston.
G. Bertram Shields, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
John P. Sleigh of St John's Wells, Fyvie.
T. G. Wilson, Carbeth Home Farm, Balfron Station.
James Wither, Awhirk, Stranraer.
James Wyllie, Tinwald Downs, Dumfries.
The Earl of Home, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*
Colonel F. J. Carruthers of Dormont, Lockerbie, Honorary Secretary, *ex officio.*

6. SCIENCE.

Major Robert W. Sharpe of The Park, Earlston, *Convener.*
Lord Rowallan, Rowallan, Kilmarnock, *Vice-Convener.*
Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh.
Ian M. Campbell, Bal Blair, Invershin.
John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.
Peter W. Crawford, Dryfeholm, Lockerbie.
James Durno, Crichie, Inverurie.
Captain Thomas Elliot, Thirlestane, Lauder.
William I. Elliot, Middletoun, Stow.
Alexander Forbes, Rettie, Banff.
W. P. Gilmour, Balmangan, Kirkcudbright.
Peter Gordon, Balcraig Moor, Port William.
George Grant of Glenfarclas, Blacksboat.
Sir John H. Milne Home, Irvine House, Canonbie.
R. Wemyss Honeyman, Derculich, Strathtay, Perthshire.
J. E. Kerr of Harviestoun, Dollar.
James R. Lumsden of Arden, Dumbartonshire.
Alexander N. M'Caig, Challoch, Stranraer.
James M'Connell, Boreland, Whauphill, Wigtownshire.
James M'Laren, Cornton, Bridge of Allan.
A. W. Montgomerie, Westburn Farm, Cambuslang, Lanarkshire.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
James Paton, Kirkness, Glencraig.
John W. Prentice, Craigrie Farm, Clackmannan.
Charles W. Ralston, Holmhill, Thornhill, Dumfriesshire.
Gavin Ralston, M.V.O., Glamis House, Glamis.
Sir Joshua Ross-Taylor, Mungoswalls, Duns.
The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.
T. Mercer Sharp, Bardrill, Blackford.
G. Bertram Shields, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
A. A. Hagart Speirs of Elderslie, Houston House, Renfrewshire.
Major S. Strang Steel of Philiphaugh, Selkirk.
Thomas Templeton, Sandyknowe, Kelso.
T. G. Wilson, Carbeth Home Farm, Balfron Station.
James Wither, Awhirk, Stranraer.
The Earl of Home, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*
Colonel F. J. Carruthers of Dormont, Lockerbie, Honorary Secretary, *ex officio.*
J. F. Tocher, D.Sc., LL.D., F.I.C., 41½ Union Street, Aberdeen, Chemist, *ex officio.*
A. E. Cameron, M.A., D.Sc., University of Edinburgh, 10 George Square Edinburgh, Consulting Zoologist, *ex officio.*

7. GENERAL PURPOSES.

Sir Joshua Ross-Taylor, Mungoswalls, Duns, Chairman of Board of Directors, *Convener.*
Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh.
Thomas Clark, Muirtons, Perth.
John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.
Captain Thomas Elliot, Thirlestane, Lauder.
William I. Elliot, Middletoun, Stow.
J. E. Kerr of Harviestoun, Dollar.
James M'Laren, Cornton, Bridge of Allan.
William Meiklem, Bennochy Park, Kirkcaldy.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
James Paton, Kirkness, Glencraig.
John W. Prentice, Craigrie Farm, Clackmannan.
The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Major **Robert W. Sharpe** of The Park, Earlston.
. **Bertram Shields**, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
Thomas Templeton, Sandyknowe, Kelso.
The **Earl of Home**, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*
Colonel F. J. **Carruthers** of Dormont, Lockerbie, Honorary Secretary, *ex officio.*

8. EDUCATION.

Colonel F. J. **Carruthers** of Dormont, Lockerbie, Honorary Secretary, *Convener.*
James M'Laren, Cornton, Bridge of Allan.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
Sir **Joshua Ross-Taylor**, Mungoswalls, Duns, Chairman of Board of Directors.
T. G. **Wilson**, Carbeth Home Farm, Balfron Station.
John Stirton, 8 Eglinton Crescent, Edinburgh, Secretary.

9. OFFICE-BEARERS.

Constitution : (1) The four Ordinary Directors for the Division in which the Show for the year is to be held (with the exception of one retiring next year) ; (2) one Ordinary Director from each of the other Show Divisions ; and (3) the Chairman of the Board, Treasurer, and Hon. Secretary, *ex officiis.*

Edinburgh .	G. **Bertram Shields**, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
	William I. Elliot, Middletoun, Stow.
	John E. B Cowper, Gogar House, Corstorphine, Edinburgh.
Inverness .	**Ian M. Campbell**, Bal Blair, Invershin.
Perth .	**John D Allan**, Culthill Implement Works, Murthly.
Glasgow .	A. A. **Hagart Speirs** of Elderslie, Houston House, Renfrewshire.
Aberdeen .	**John P. Sleigh** of St John's Wells, Fyvie.
Borders .	Major **Robert W. Sharpe** of The Park, Earlston.
Stirling .	J. E. **Kerr** of Harviestoun, Dollar.
Dumfries .	**James Wither**, Awhirk, Stranraer.

Sir **Joshua Ross-Taylor**, Mungoswalls, Duns, Chairman of Board of Directors, *ex officio.*
The **Earl of Home**, K.T., The Hirsel, Coldstream, Treasurer, *ex officio.*
Colonel F. J. **Carruthers** of Dormont, Lockerbie, Honorary Secretary, *ex officio.*

REPRESENTATIVES ON OTHER BODIES.

National Agricultural Examination Board and National Dairy Examination Board.

Colonel F. J. **Carruthers** of Dormont, Lockerbie.
James M'Laren, Cornton, Bridge of Allan.
Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.
Sir **Joshua Ross-Taylor**, Mungoswalls, Duns.
T. G. **Wilson**, Carbeth Home Farm, Balfron Station.
John Stirton, 8 Eglinton Crescent, Edinburgh.

Edinburgh and East of Scotland College of Agriculture.

John Stirton, *Secretary*, Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh.

West of Scotland Agricultural College.

William Brown, Craigton, Bishopton.

Aberdeen and North of Scotland College of Agriculture.

J. F. Tocher, D.Sc., LL.D., F.I.C., 41½ Union Street, Aberdeen.

Royal (Dick) Veterinary College.

John E. B. Cowper, Gogar House, Corstorphine, Edinburgh.

Glasgow Veterinary College.

Alexander Murdoch, East Hallside, Cambuslang, Lanarkshire.

Scottish Milk Records Association.

W. P. Gilmour, Balmangan, Kirkcudbright.
John W. Prentice, Craigrie Farm, Clackmannan.
James Wither, Awhirk, Stranraer.

National Trust for Scotland.

The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Royal Scottish Agricultural Benevolent Institution.

Sir Joshua Ross-Taylor, Mungoswalls, Duns.

Association for the Preservation of Rural Scotland.

The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Scottish Country Industries Development Trust.

The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.
Laurence R. Younger, Dabton, Thornhill, Dumfriesshire.

SCOTTISH PLANT REGISTRATION STATION.

Standing Committee of Management.

Major R. F. Brebner, The Leuchold, Dalmeny House, Edinburgh.
G. Bertram Shields, Eastfield, Clermiston Road, Corstorphine, Edinburgh.
James Wither, Awhirk, Stranraer.

Appointed for 5 years from 1st January 1936.

MEETINGS.

General Meetings.—By the Charter the Society must hold two General Meetings each year, and, under ordinary circumstances, they are held in the months of January and June, for the election of Members and other business. Twenty a quorum.

By a resolution of the General Meeting held on 15th January 1879, a General Meeting of Members is held in the Showyard on the occasion of the Annual Show. In 1938 it will be held at Dumfries, on the Wednesday of the Show, at an hour to be announced in the Programme of the Show.

With reference to motions at General Meetings, Bye-Law No. 19 provides that—" At General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given two weeks previously to the Board of Directors, without prejudice, however, to the competency of a motion or proposal, of which due notice has not been given, being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting."

Directors' Meetings.—The Board of Directors meet (except when otherwise arranged) on the first Wednesday of each month from November to June, inclusive, at 1.30 P.M., and occasionally as business may require, on a requisition by three Directors to the Secretary, or on intimation by him. Seven a quorum.

Committee Meetings.—Meetings of the various Committees are held as required.

Nomination of Directors.—Meetings of Members, for the purpose of nominating Directors to represent the Show Divisions on the Board for the year 1939-1940, will be held at the places and on the days after-mentioned :—

DIVISION.		
1. *Edinburgh.*	Market Buildings, Gorgie, Edinburgh .	Wed., 25th Jan. 1939, at 1.
2. *Glasgow.*	Central Station Hotel, Glasgow . .	Wed., 8th Feb. 1939, at 1.
3. *Stirling.*	Golden Lion Hotel, Stirling. . .	Thur., 9th Feb. 1939, at 1.30.
4. *Perth.*	County Buildings, Cupar . . .	Tues., 14th Feb. 1939, at 2.30.
(The Meeting will be held in 1940 and 1941 at Perth ; in 1942 at Cupar.)		
5. *Borders.*	Railway Hotel, St Boswells. . .	Thur., 16th Feb. 1939, at 2.
6. *Inverness.*	Station Hotel, Inverness . .	Tues., 21st Feb. 1939, at 2.
7. *Aberdeen.*	Imperial Hotel, Aberdeen . . .	Fri., 24th Feb. 1939, at 2.30.
8. *Dumfries.*	King's Arms Hotel, Dumfries . .	Wed., 8th Mar. 1939, at 2.

The nomination of a Proprietor or other Member paying the higher subscription must be made in the 1st, 2nd, 4th and 5th Divisions ; and the nomination of a Tenant-Farmer or other Member paying the lower subscription in the 3rd, 6th, 7th and 8th Divisions.

Retiring Directors are not eligible for re-election until after the lapse of at least one year.

GENERAL SHOW.

The 107th Annual Show of Stock, Implements and Machinery, &c., will be held at Dumfries on 21st, 22nd, 23rd and 24th June 1938. For closing dates for Entries, Premiums offered, &c., see ' Regulations and Prize List ' herein.

EXAMINATIONS.

Agriculture.—The Examination in 1938 for the National Diploma in Agriculture will be held at Leeds University on 4th April 1938 and following days. Applications close on 19th February 1938.

Dairying.—The Examination in 1938 (Scottish Centre) for the National Diploma in Dairying will be held at the Dairy School for Scotland, Auchincruive, Ayr: *Written*—On 7th, 8th and 9th September 1938. *Oral and Practical*—On 19th September 1938 and following days. Applications close on 30th July 1938.

Forestry.—The Final Examination for the Society's First and Second-Class Certificates in Forestry was held in 1935.

In view of the institution of Examinations for Certificates and Diplomas in Forestry by the Royal Scottish Forestry Society, and by arrangement with that Society, the Board of Directors of the Highland and Agricultural Society of Scotland resolved in 1935 to cease holding further Examinations for the First and Second-Class Certificates, and that, in future, the granting of Certificates and Diplomas be left in the hands of the Royal Scottish Forestry Society.

All communications in connection with Examinations in Forestry should now be addressed to the Secretary, Royal Scottish Forestry Society, 8 Rutland Square, Edinburgh 1.

NATIONAL DIPLOMA IN AGRICULTURE

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

From 1858 to 1899 the Society held an annual Examination for Certificate and Diploma in Agriculture. In 1873 the Free Life Membership of the Society was granted to winners of the Diploma. In 1882 permission was given to holders of the Diploma to append the letters F.H.A.S. to their names. These arrangements terminated in 1899.

In 1898 it was resolved by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland to discontinue the independent Examinations in Agriculture held by the two Societies, and to institute in their stead a Joint-Examination for a NATIONAL DIPLOMA IN AGRICULTURE (N.D.A.). This Examination is now conducted under the management of "The National Agricultural Examination Board" appointed by the two Societies. The first Joint Examination was held in 1900.

REGULATIONS FOR EXAMINATION IN THE SCIENCE AND PRACTICE OF AGRICULTURE

1. The Societies may hold conjointly, under the management of the National Agricultural Examination Board appointed by them, an Annual Examination in the Science and Practice of Agriculture, at a convenient centre.

2. Candidates who pass the Examination will receive the National Diploma in Agriculture—the Diploma to be distinguished shortly by the letters "N.D.A."

3. The Examination will be conducted by means of written papers and oral examinations.

4. In order to be eligible to sit for the Board's Examination in Agriculture, a candidate must—

(*a*) Present a certificate from a recognised Agricultural College that his attainments in the subjects of *General Botany, Geology, General Chemistry, Physics, and Mechanics,* as attested by class and other examinations, are, in the opinion of the authorities of the College, such as to justify his admission to the Board's Examination; *or*

(*b*) Produce evidence that he has passed the 1st B.Sc. or the Intermediate Examination in Science of a British University; *or*

(*c*) Present a School Certificate awarded by a British University Examination Board, and produce evidence that he has continued his study of science for at least a year and has obtained a certificate in Physics, Chemistry and Botany at the Higher Certificate Examination of a British University Examination Board; *or*

(*d*) Present a Leaving Certificate in Science (including Chemistry and Botany) of the Scottish Education Department.

5. In the case of students who satisfy the Board that they have not had the facilities for obtaining the foregoing certificates, the Board will be prepared to consider evidence of equivalent attainment. [Applications under this rule must be lodged *three months* before the date of the annual examination.]

6. *Before sitting for the* PRACTICAL AGRICULTURE *and* FARM MACHINERY AND IMPLEMENTS *papers, all candidates must produce evidence of possessing a practical knowledge of Agriculture obtained by residence on a farm in the British Isles for a period or periods (not more than two) covering a complete year of farming operations.*

7. Candidates will have the option of taking the whole of the following nine papers at one time, or of sitting for a group of any three, four, or five in the first year and the remaining subjects (at one examination) within the next two years:—

SUBJECT.	Maximum Marks.	Pass Marks.
1. Practical Agriculture (First Paper)	400	240
2. Practical Agriculture (Second Paper)	400	240
3. Farm Machinery and Implements	300	150
4. Land Surveying and Farm Buildings	100	50
5. Agricultural Chemistry	200	100
6. Agricultural Botany	200	100
7. Agricultural Book-keeping	200	100
8. Agricultural Zoology	100	50
9. Veterinary Science and Hygiene	200	100
	2100	1130

NOTE.—Candidates taking the Examination in two groups of subjects are recommended to take Agricultural Chemistry and Agricultural Botany in the first group.

8. A candidate who obtains not less than three-fourths (1575) of the aggregate maximum marks (2100) in the entire Examination will receive the Diploma with Honours, provided that he obtains not less than three-fourths (600) of the maximum marks (800) in the two Practical Agriculture papers.

9. Candidates electing to take the entire Examination at one time and failing in not more than three subjects may appear for these subjects in the following year. Failure in more than three subjects will be regarded as failure in the whole Examination.

10. In the case of candidates electing to take the Examination in two groups—

(*a*) A candidate appearing for a group of *three* subjects and failing in a single subject may, *in the case of a first group*, appear for that subject along with the second group, or, *in the case of a second group*, in the following year. Failure in more than one subject will be regarded as failure in the group.

(*b*) A candidate appearing for a group of *four* or more subjects and failing in not more than two subjects may, *in the case of a first group*, appear for these subjects along with the second group, or, *in the case of a second group*, in the following year. Failure in more than two subjects will be regarded as failure in the group.

11. Non-returnable fees must be paid by candidates as follows:—

Entire Examination . . .	Six guineas.
Group of subjects	Three guineas.
Reappearance for any subjects .	10/6 per subject.

12. The Board reserve the right to postpone, abandon, or in any way, or at any time, modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

The Examination will take place at Leeds University on MONDAY, 4th APRIL 1938, and following days.

Forms of application for permission to sit at the Examination may be obtained from "The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C. 1," or from "The Secretary, Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh 12," and must be returned duly filled up not later than SATURDAY, 19th FEBRUARY 1938, when the Entries will close.

SYLLABUS OF SUBJECTS OF EXAMINATION.

PRACTICAL AGRICULTURE.

1.—FIRST PAPER.

1. *British Farming.*—Arable, stock-raising, dairying—Approximate areas covered by the different systems—Typical examples of each—Area in Great Britain under chief crops—Numbers of live stock—The recent history of agriculture—Short summary of agricultural returns.

2. *Climate.*—The effect of climate on farming practice—Rainfall—Temperature—Prevailing winds—Weather forecasts.

3. *Soils.*—The influence of geological formations on the systems of farming—Classification of soils—Character and composition—Suitability for cultivation. Reclamation—Drainage—Irrigation—Warping—Application of lime and marl—Bare fallows—Tillage—Subsoiling—Deep and thorough cultivation.

4. *Manures.*—The manures of the farm—The treatment of farmyard manure—The disposal of liquid manure and sewage—General manures—Special manures—Field trials of manures—The application of manures—Period of application and amounts used per acre—Unexhausted value of manures and feeding-stuffs.

5. *Crops.*—Wheat, barley, oats, rye, beans, peas, potatoes, turnips, swedes, mangolds, sugar beet, forage plants, hops, and other crops—Their adaptation to different soils and climates—Varieties—Selection of seed—Judging seeds—Cultivation, weeds and parasitic plants, best methods of prevention and eradication—Harvesting—Storing—Cost of production—Improvement of crops by selection and hybridising—Field trials—Methods which the farmer may adopt—Selection to resist disease—The principles of rotations—Rotations suitable for different soils and climates—Rotations and the maintenance of fertility—Green manuring—Leguminous crops in rotation—Catch crops—The advantages and disadvantages of rotations—Specialised farming—Management of Orchards.

2. —SECOND PAPER.

6. *Live Stock.* The different breeds of British live stock—Their origin, characteristics, and comparative merits—Suitability for different districts Breeding -General principles—Selection—Mating —Crossing Rearing and general management—Breeding and rearing of horses, cattle, sheep, pigs, and poultry. Rearing colts and raising store stock The foods of the farm—Their composition and suitability for different classes of stock—Purchased foods—Composition and special value- Rations for different kinds and ages of stock—Cost of producing beef, mutton, pork, and milk—Cost of feeding farm horses.

7. *The disposal of Crops, Produce, and Stock.* Marketing grain and other crops -Sale of stock—Live weight—Dead weight.

8. *Milk.*—The production and treatment of milk—The manufacture of cheese, butter, &c.—The utilisation of by-products.

9. *Farming Capital.*- Calculations of the stocking and working of arable, stock, and dairy farms—Farm valuations—Rent and taxes.

10. *Labour.*—Organisation of labour—piece-work, time-work—labour costings.

11. *Renting a Farm.*- -Indications of condition, productive power, and stock-carrying capacity—Leases—-Conditions of occupancy.

N.B.—*It is essential that a candidate know his subject practically, and that he satisfy the Examiner of his familiarity with farm work and management.*

3.—FARM MACHINERY AND IMPLEMENTS.

1. *Power.*—The principle of action, construction, method of working, also care and management of steam engines and boilers, gas, oil and petrol engines and agricultural tractors. Cost and working expenses in connection with the above. Estimation of the brake horse-power of engines. Power derived from water. Measurement of the quantity of water flowing in a stream. General arrangement of water-power plants. Water-wheels. Turbines. Pumps—principle of action and construction. Flow of water through pipes. Hydraulic ram. Windmills.

2. *Agricultural Implements and Machinery.*—The mode of action and the general principles involved in the construction and working of farm implements and machinery. Arrangement of machinery with respect to the power plant. Pulleys and belting. Shafting and bearings. Lubrication. Lifting appliances. Strength and care of chains. Concrete and its use in the construction of simple foundations for engines and machines.

3. *Implements of Cultivation.*—Ploughs—Cultivators—Grubbers—Harrows—Drills. Manure Distributors. Seeding and planting implements.

4. *Implements of Harvesting.*—Mowing and Reaping machines—Rakes—Tedders—Elevators—Potato raisers.

5. *Implements of Transit.*—Carts, waggons, rick lifters, tractors.

6. *Threshing and Food-preparing Machinery.*—Threshing machines,

stationary and portable—Screen Winnowers—Hummelers, Chaff cutters—Pulpers—Cake breakers.

7. *Dairy Appliances.*—Milking machines—Cream separators—Churns and other butter-working appliances—Milk delivery cans—Cheese-making utensils—Vats and presses.

N.B.—*Candidates are expected to have had some experience with agricultural machinery and implements under actual working conditions, and to be capable of illustrating their answers, when necessary, by intelligible sketches or diagrams.*

4.—LAND SURVEYING AND FARM BUILDINGS.

1. The use and adjustment of instruments employed in Surveying and Levelling other than the Theodolite.

2. Land surveying by chain. Plotting from field book, and determination of areas surveyed. The simpler "field problems."

3. Levelling and plotting from field book.

4. A knowledge of the various classes of maps published by the Ordnance Survey Department and their Scales.

5. *Roads and Fences.*—The construction and maintenance of farm roads, fences, and ditches.

6. *Land Drainage.*—Methods of draining; mole and pipe drains; cost of construction and maintenance.

7. *Buildings.*—Buildings required on different classes of farms—Economical arrangement of farm buildings—Materials—Construction—Ventilation—Drainage—Water supply—Dimensions of dairy, stables, cowsheds, yard, courts, and piggeries—Accommodation for power—Implement, machinery, and cart sheds—Hay and grain sheds—Shelter sheds—Storage of manure.

N.B.—*Each candidate should have with him at the Examination a pair of compasses, scales of equal parts, including scales of one chain to the inch, 4 feet to the inch, 8 feet to the inch, and the scale fitting the Ordnance Map,* $\frac{1}{2500}$ *or 25·344 inches to the mile, a small protractor, a set-square, and a straight-edge about 18 inches in length.*

5.—AGRICULTURAL CHEMISTRY.

1. *The Atmosphere.*—Its composition and relations to plant and animal life.

2. *Water.*—Rain water—Soil water and drainage—Drinking water—Sewage and irrigation.

3. *The Soil.*—Origin, formation, and classification of soils—Sampling—Analysis—Composition of soils—The chemical and physical properties of soils—The water and air of the soil—Biological changes in the soil—The soil in relation to plant growth—Fertility—Causes of infertility—Improvement of soils.

4. *Manures.*—Theories of manuring—Classification of manures—Origin, nature, and characteristics of manures—Manufacture of manures—Composition, analysis, adulteration, and valuation of manures—Farmyard manure and other natural manures—Green-manuring—Liming, marling, claying—Artificial manures, their

origin and manufacture—Fertilisers and Feeding Stuffs Act—Sampling of manures.

5. *Poisons, Antiseptics, and Preservatives.*—General chemical composition and character of insecticides, fungicides, antiseptics, and preservatives used on the farm.

6. *Plants and Crops.*—Constituents of plants—Assimilation and nutrition of plants—Sources of the nitrogen and other constituents of plants—Germination—Action of enzymes—Composition and manurial requirements of farm crops—Food products derived from crops—Manuring experiments.

7. *Animals.*—Composition of animal body—Animal nutrition—Digestion—Assimilation, metabolism, respiration, and excretion.

8. *Foods and Feeding.*—Constituents of foods—Origin, nature, and composition of chief feeding-stuffs—Sampling, analysis, and adulteration of foods—Nutritive value and digestibility of food—Functions of chief food constituents—Energy values—Vitamins—Relation of foods to the production of work, meat, milk, and manure—Manurial residues of foods.

9. *Dairy Chemistry.*—The composition of milk, cream, butter, cheese, &c.—Conditions which influence the composition of milk and milk products—Action of ferments and enzymes on milk and milk products—Milk-testing—Analysis and adulteration of dairy products.

N.B.—*Candidates who are in possession of Laboratory Notes are required to bring them to the Oral Examination in this subject.*

6.—AGRICULTURAL BOTANY.

In addition to a *general knowledge* of the morphology, histology, and physiology of plants, candidates will be expected to possess a *detailed knowledge* of the following subjects:—

The classification of plants of importance in agriculture as shown by a detailed study of the genera, species, and botanical varieties of the British Crop Plants and Weeds included in the following families:—

Ranunculaceæ.
Cruciferæ.
Caryophyllaceæ.
Leguminosæ.
Rosaceæ.
Umbelliferæ.
Compositæ.
Solanaceæ.
Scropulariaceæ.
Labiatæ.
Chenopodiaceæ.
Polygonaceæ.
Liliaceæ.
Gramineæ.

British grasses of agricultural importance: recognition of, at any stage of growth. Habitats of important species. Constitution of the grass flora of good meadows and pastures. Composition of seed mixtures for temporary and permanent leys on various soils. The effects of artificial manures on the flora of grass land.

The weeds of arable and grass land. Poisonous and parasitic weeds. Methods of distribution by seed and vegetatively: of eradication. Weeds as soil indicators. Recognition of the seeds of the common weeds, particularly those characteristically found in clover, grass, &c., seed.

The chief varieties of wheat, barley, oats, clovers, roots, and other farm crops: their suitability for various climatic and soil conditions. The identification of the more important types of cereals by means of their grain characters. Characteristics of good and bad samples of cereals.

Identification of materials used in feeding cakes and meals.

Plant-breeding. Principles of heredity in plants. Pure lines. Fluctuating variability. Selection.

Disease in plants. Diseases due to the effects of parasitic fungi. Resistance to disease: conditions affecting. Fungoid diseases scheduled from time to time by the Ministry of Agriculture and Fisheries.

Yeasts and fermentation.

The general outlines of bacteriology: nitrogen fixation, nitrification, and denitrification. Putrefaction and the bacteriology of milk, butter, and cheese.

N.B.—*Candidates who are in possession of Laboratory Notes are required to bring them to the Oral Examination in this subject.*

7.—AGRICULTURAL BOOK-KEEPING.

1. Advantages of book-keeping to the farmer. Difficulties and how they can be overcome. Objects of book-keeping.
2. General principles of book-keeping. Double-entry system. Description and use of various books. Ledger, journal, cash-book, petty cash-book, day-books, &c. Entering transactions; posting; trial balance; closing the accounts. Single-entry system.
3. Special ledger accounts: Interest depreciation, rent and rates, improvements, private and household expenses, profit and loss and capital; partnership accounts.
4. Bank business. Opening a bank account. Use of cheques. Deposits and overdrafts.
5. General office work; correspondence, order notes, invoices, rendering accounts, receipts, &c. Filing systems.
6. Farm valuations for book-keeping purposes. Dates for stock-taking and principles of valuation. The farm balance-sheet.
7. Systems of farm book-keeping. Conditions that determine the most suitable system. Advantages and drawbacks of each system.
8. Accounts for the owner-occupier. Treatment of rent. Incidence of rates and tithe in England and Scotland, and their treatment as between farm and estate accounts. Improvements and upkeep and the general principles relating to maintenance claims.
9. Cost accounting. General principles and methods. Advantages, objects, difficulties.
10. Interpretation of results from ordinary and from cost accounts. Precautions necessary. Use of accounts as a guide to efficient management.
11. Income Tax. How the farmer is assessed. Preparation of Income Tax return. Treatment of Income Tax in accounts.

8.—AGRICULTURAL ZOOLOGY.

The Examination is designed to test practical knowledge, and therefore Candidates will be expected to recognise the animals of agricultural importance referred to in the Syllabus.

GENERAL.

A general knowledge of the characteristics of living animals and how they differ from plants.

One-celled animals, *e.g.*, Amœba, and many-celled animals.

General outline of the classification of animals and the characters on which it is based.

Organic Evolution. Theories of Heredity.

SPECIAL.

I. *Invertebrates.*—A. The Worm Parasites of Stock. Flat and Round Worms. Structure and Life History, for example, of Liver-fluke, Tapeworm, Ascaris. The mode of life and life history of the chief worm enemies of the domesticated animals. Preventive and remedial measures.

B. The Arachnid enemies of Stock: Mange or Scab Mites, Demodex Mites, Ticks. External structure and life history. Control measures.

C. The Insect enemies of Stock: (*a*) External parasites, *e.g.*, gadflies, warble flies, blue-bottles, green-bottles, stable fly, ked, lice; (*b*) Internal parasites, *e.g.*, bot and warble flies.

D. Insects injurious to Crops: Structure and classification of insects. Mode of life and life history of the chief insect pests of agricultural crops.* Control, preventive and remedial measures—natural control; artificial control (Insecticides).

* *The chief pests are detailed in Pamphlets issued by the Ministry of Agriculture and Fisheries.*

E. Other invertebrates of agricultural importance, *e.g.*, earthworms, eelworms, slugs and snails, centipedes and millepedes, gall mites.

II. *Vertebrates.*—Birds: the commoner birds of farm importance, their recognition and an estimate of their work.

Mammals: Outstanding characters for recognition, and the economic importance of:—

1. Ungulata or Hoofed Mammals, *e.g.*, horse, pig, cattle, sheep, deer.
2. Rodentia or Gnawing Mammals, *e.g.*, hares, rabbits, rats, mice voles, squirrels.
3. Insectivora, *e.g.*, mole, hedgehog, shrew.
4. Carnivora, *e.g.*, dog, fox, polecat, stoat, weasel, badger.

N.B.—*Candidates who are in possession of Laboratory Notes are required to bring them to the Oral Examination in this subject.*

9.—VETERINARY SCIENCE AND HYGIENE.

1. Elementary anatomy and physiology of the horse, ox, sheep, and pig, and their relation to unsoundness and disease.

2. The general principles of breeding—including the physiology of reproduction, the laws of heredity, the periods of gestation, and the signs of pregnancy in the mare, cow, ewe, and sow.

3. Dentition as a means of determining the age of horses, cattle, sheep, and swine.

4. The management of farm stock in health and disease.

N.B.—*Candidates who are in possession of Laboratory Notes are required to bring them to the Oral Examination in this subject.*

WINNERS OF DIPLOMA IN 1937.

Diploma with Honours.

1st. Harold Richmond Kirby, Midland Agricultural College, Sutton Bonington, Loughborough.
2nd. Donald Lindsay Sinclair, Harper Adams Agricultural College, Newport, Shropshire
3rd. John Pearce, University of Reading.
4th. Kenneth Norton Russell, University of Reading.

Diploma.

Raymond Hart Aitkenhead, University of Leeds
Kenneth John Allright, South Eastern Agricultural College, Wye, Kent.
William Percival John Arthur, University of Reading
George Henry Beard, Midland Agricultural College, Sutton Bonington, Loughborough.
Paul Benckendorff, Harper Adams Agricultural College, Newport, Shropshire
Horace Haddon Brownlow, Midland Agricultural College, Sutton Bonington, Loughborough
James Barnard Cureton, Armstrong College, Newcastle-upon-Tyne
Sydney Gwyn Davies, University College of Wales, Aberystwyth
Anthony John Marsh Davison, South Eastern Agricultural College, Wye, Kent.
Gordon Sholto Douglas-Jones, South Eastern Agricultural College, Wye, Kent
David Stanley Downey, University College of Wales, Aberystwyth.
Frederick William Dunnett, East Anglian Institute of Agriculture, Chelmsford.
Richard Kelland Eminson, Midland Agricultural College, Sutton Bonington, Loughborough.
Walter James Ferguson Gardner, West of Scotland Agricultural College, Glasgow
Robert Garside, Armstrong College, Newcastle-upon-Tyne
Roy Gillard, Seale Hayne Agricultural College, Newton Abbot, Devon.
Frank Edwin Harnett, University of Reading.
Kenneth John Harris, University of Reading.
Leonard Bradberry Hawkes, School of Agriculture, Cambridge.
Alfred John Hayes, East Anglian Institute of Agriculture, Chelmsford.
Andrew Howie, University of Glasgow & West of Scotland Agricultural College
Jean Morris Kedward, University of Glasgow & West of Scotland Agricultural College.
John Keir, South Eastern Agricultural College, Wye, Kent.

John Thomas Richardson Lockwood, Midland Agricultural College, Sutton Bonington, Loughborough.

Alan George McCall, West of Scotland Agricultural College, Glasgow.

Bedford Hugh Nicholas M'Neill, South Eastern Agricultural College, Wye, Kent.

John Marshall Marsden, Midland Agricultural College, Sutton Bonington, Loughborough.

Henry Corbett Mason, Midland Agricultural College, Sutton Bonington, Loughborough.

Samuel Barr Maxwell, University of Edinburgh & East of Scotland College of Agriculture.

Hamilton Alexander Montgomery, West of Scotland Agricultural College, Glasgow.

Kenneth James Rampling, East Anglian Institute of Agriculture, Chelmsford.

Geoffrey Millar Ramsden, Harper Adams Agricultural College, Newport, Shropshire.

Elinor Mabel Capon Roper, East Anglian Institute of Agriculture, Chelmsford.

Ralph Segal, University of Glasgow & West of Scotland Agricultural College.

James Struthers Symington, University of Glasgow & West of Scotland Agricultural College.

William Thomas Thornycroft, Harper Adams Agricultural College, Newport, Shropshire.

Aubrey Ralph Treble, Midland Agricultural College, Sutton Bonington, Loughborough.

John Pinhey Walker, East Anglian Institute of Agriculture, Chelmsford.

William Arthur Wannop, Harper Adams Agricultural College, Newport, Shropshire.

Finlay Simpson Watson, University of Edinburgh & East of Scotland College of Agriculture.

Thomas Archibald Willis, Harper Adams Agricultural College, Newport, Shropshire.

Stephen Wooldridge, East Anglian Institute of Agriculture, Chelmsford.

Charles Oswald Wright, Harper Adams Agricultural College, Newport, Shropshire.

Henry Roger Wyeld, Midland Agricultural College, Sutton Bonington, Loughborough.

Examination Papers of Past Years.

Copies of papers set at past Examinations in Agriculture, so far as available, may be had on application. Price 6d. per set.

Sets of N.D.A. Papers available are those for the years 1930-1937 inclusive.

NATIONAL DIPLOMA IN DAIRYING

This Examination, instituted in 1897, is conducted by "The National Dairy Examination Board," appointed jointly by the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the British Dairy Farmers' Association.

REGULATIONS FOR EXAMINATION IN THE SCIENCE AND PRACTICE OF DAIRYING

1. The Societies may hold annually in England and in Scotland, under the management of the National Dairy Examination Board appointed by them, one or more examinations for the National Diploma in the Science and Practice of Dairying; the Diploma to be distinguished shortly by the letters 'N.D.D.'

2. The Examinations will be held on dates and at places from time to time appointed and duly announced.

3. Forms of Entry for the Examination in England may be obtained from 'The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C.1,' and must be returned to him duly filled up, with the entry fee, on or before Wednesday, 20th July 1938.

4. Forms of Entry for the Examination in Scotland may be obtained from 'The Secretary, Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh 12,' and must be returned to him duly filled up, with the entry fee, on or before Saturday, 30th July 1938.

5. Any candidate may enter for the Examination either in England or Scotland, but not in both, and a candidate who has once taken part in an Examination in England cannot enter for an Examination in Scotland, or *vice versa. An exception may be made in favour of a candidate reappearing under Regulation* 11 (3) *provided special application is made at the time of entry.*

6. As a preliminary to the acceptance of any application for permission to enter for the Examination, a candidate must produce:—

(1) A certificate testifying that he or she has attended a Diploma Course in the subjects of the Examination covering *two*

academic years at an approved Dairy Training Institution and has satisfied the authorities of the Institution of his or her fitness for admission to the Examination. This period shall include six session months' instruction (consisting of not more than two periods) in practical dairy work.

(2) Evidence that he or she has spent at least six months in not more than two periods on an approved Dairy farm and taken part in the work. This period must not run concurrently with the six months' practical training referred to in subsection 1.

A Dairy Farm to be approved must have not fewer than fifteen cows kept in daily milking.

7. A candidate who has already taken a Degree in Agriculture of a British University, or a Diploma in Agriculture recognised by the National Dairy Examination Board, will be allowed to enter for the National Diploma in Dairying Examination after one year's *subsequent* training at an approved Dairy Training Institution, providing that such course includes at least six months' training in practical dairy work, and that he or she has worked for at least six months on an approved Dairy Farm.

8. In the Examination a candidate will be required to satisfy the Examiners by means of written papers, practical work, and *viva voce*, that he or she has :—

(1) A general knowledge of the Management of a Dairy Farm, including the rearing and feeding of Dairy Stock, the candidate being required to satisfy the Examiners that he or she had had a thorough training and practical experience in all the details of Dairy work as pursued on a farm.

(2) A thorough acquaintance, both practical and scientific, with everything connected with the management of a Dairy, and the manufacture of Butter and Cheese.

(3) A general knowledge of Dairy Factory Management, Dairy Hygiene, Dairy Engineering, and Dairy Book-keeping.

(4) Practical skill in Dairying, to be tested by the making of Butter and Cheese.

NOTE.—A candidate must be prepared to make any one of the following varieties of Hard Pressed Cheese, the Examiner in Cheese-making having the option of saying during the Examination what variety a candidate shall make :—

AT THE ENGLISH CENTRE : Cheddar, Cheshire, or Derby.

AT THE SCOTTISH CENTRE : Cheddar, Dunlop, or Cheshire.

9. Candidates will have the option of :—

(*a*) Taking the whole Examination at one time ; or

(*b*) Taking the Examination in two parts.

A candidate taking the Examination in two parts must take the following subjects at the first sitting : DAIRY FARMING, DAIRY HYGIENE, PRINCIPLES OF DAIRYING, DAIRY FACTORY MANAGEMENT

AND DAIRY ENGINEERING, PRACTICAL CHEESE-MAKING AND BUTTER-MAKING; the remaining three Papers, CHEMISTRY AND PHYSICS, DAIRY BACTERIOLOGY, and DAIRY BOOK-KEEPING, to be taken at the Examination in the following year.

10. The maximum marks obtainable and the marks required for a pass in each subject are as follow:—

	Max.	Pass
WRITTEN EXAMINATION—		
Dairy Farming	150	90
Dairy Hygiene	100	60
Dairying—		
(*a*) Principles of Dairying	150	90
(*b*) Dairy Factory Management and Dairy Engineering	100	50
Chemistry—		
(*a*) General Chemistry and Physics (*b*) Dairy Chemistry	100	60
Dairy Bacteriology	100	60
Dairy Book-keeping	100	50
PRACTICAL EXAMINATION—		
Hard-pressed Cheese-making	200	150
Blue-veined Cheese-making	100	75
Soft Cheese-making	100	75
Butter-making	200	150
	1400	910

Honours will be awarded to candidates obtaining an aggregate of 80 per cent (1120) of the maximum marks (1400) in the Examination, provided that they also obtain at least 80 per cent (400) of the maximum marks (500) in the Dairy Farming, Hygiene, and Dairying papers.

11. A candidate taking the whole Examination at one time:—

(1) who fails in any part of the practical examination shall fail in the whole examination.

(2) who fails in four or more subjects of the written examination shall fail in the whole examination.

(3) who, having passed in the practical examination, fails in not more than three subjects of the written examination may, at the discretion of the Board, appear for those subjects in the following year. The Board may in certain circumstances require evidence of further study in these subjects.

12. A candidate taking the Examination in two parts, and failing in a *single subject* in the first part of the Examination, may, at the discretion of the Board, appear for that subject along with the second part; or, in the case of a *single subject* of the second part, in the following year. The Board may in certain circumstances require evidence of further study in that subject.

Failure in more than one subject will be regarded as failure in that part of the Examination. Failure in any part of the Practical Examination will entail complete failure.

13. The entrance fees will be as follow:—

For the whole Examination taken at one time	£3	3	0
For the Examination taken in two parts:			
First part	3	3	0
Second part	1	1	0
For reappearance, 10s. 6d. each subject.			

14. The Board reserve the right to postpone, to abandon, or in any way or at any time to modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

DATES OF EXAMINATIONS.

SCOTLAND.—At the Dairy School for Scotland, Auchincruive, Ayr. WRITTEN—Wednesday, Thursday, and Friday, 7th, 8th, and 9th September 1938. ORAL AND PRACTICAL—Monday, 19th September 1938, and following days. Last date for receiving Applications, Saturday, 30th July 1938.

ENGLAND.—At the University and British Dairy Institute, Reading. Wednesday, 7th September 1938, and following days. Last date for receiving Applications, Wednesday, 20th July 1938.

SYLLABUS OF SUBJECTS OF EXAMINATION.

I.—DAIRY FARMING AND DAIRY HYGIENE.

(*a*) Dairy Farming.

Soils and Crops.—Types of Soils suitable for dairying. Rotations and systems of cropping. Cultivation, manuring and management of grain, root and forage crops used in dairying. Silage. Temporary and permanent pastures, haymaking.

Plant Physiology.—Roots, shoots, flowers, fruit and seeds of agricultural plants.

Dairy Cattle.—Characteristics of different breeds. Relation of conformation and appearance to Milk Yield. Choice of dairy cattle in relation to climate and soil. The milk yields of the more important breeds, and suitability for the milk trade, cream, butter and cheese production.

The management of a Dairy Herd. Cattle breeding and grading up of dairy stock. Calf rearing and management of young stock.

Milk recording. Systems, and utilisation of results. Details of official schemes.

Foods and Feeding.—Summer and winter feeding of dairy cattle and young stock. Fodder crops and green forage. Roots. Ensilage. Concentrated foods, meals, cakes. Preparation of food. The effect of food on milk and its products.

Pig Keeping.—Characteristics of the more important breeds. The breeding, rearing and fattening of pigs. Production of pork and bacon.

Farm Management.—Systems of dairy farming. The selection, stocking and equipment of typical farms. Organisation of the farm and disposal of produce.

Dairy Economics.—The Dairy Industry of Great Britain and its relationship to Agriculture. The relative importance of the various products. The retail milk trade. Markets, Dairy organisation and co-operation. Modern developments in the Dairy industry. Sources of imported Dairy Produce.

(b) Dairy Hygiene.

Animal Physiology.—General functions of the organs of the animal body. Breeding. Parturition. The structure of the udder and the process of milk secretion. Changes which food undergoes during digestion.

Veterinary Science.—The more important diseases of dairy cattle and their treatment. The transmission and eradication of disease.

Milk Hygiene.—Sanitary conditions. Suitability of water supply. Methods of milking and handling of milk. Regulations affecting milk production. Milk in relation to Public Health.

Farm Buildings.—Situation, chief dimensions and construction of cow houses and dairy buildings. Housing for young stock and pigs. Air space and ventilation, drainage and water supply.

II.—DAIRYING.

(a) Principles of Dairying.

Milk.—Milking by hand and machinery. Importance of cleanliness. Cooling of milk. Prevention of contamination. Pasteurisation. Sterilisation. Keeping of milk. Milk testing and sampling. Use of Gerber and Babcock Testers. Interpretation of results. Legal standards. Legislation affecting milk production.

Cream.—Separators and their management. Different systems of cream raising and ripening of cream. Changes during ripening. Natural and artificial ripening, and preparation and uses of starters. Preparation of cream for sale. Uses of preservatives. Clotted cream.

Butter.—Churns and butter-making appliances. Preparation of cream for churning. Washing and working butter. Butter milk. Packing and transmission of butter. Selection and keeping of butter. Salting. Use of preservatives. Characteristics of good butter and method of judging. Circumstances affecting the flavour, texture, colour and keeping qualities of butter. Potting butter for keeping. Causes of inferior butter.

CHEESE.—Principles of manufacture. Appliances for cheese-making. The making of the principal varieties of British, Colonial and Continental cheese from cream, whole milk and skim milk. Acidity of milk. Common tests for acidity. Uses of rennet and its substitutes. Whey. Ripening and storage of cheese. Packing and sale of cheese. Making of cream and other soft cheese. Defects in cheese and their causes. Judging cheese.

(b) DAIRY FACTORY MANAGEMENT AND DAIRY ENGINEERING.

FACTORY PRACTICE.—Milk depots and handling of factory milk. Systems of cooling and refrigeration. Pasteurisation. Factory butter and cheese-making. Milk Powders. Condensed milk. Frozen milk. Ice cream. Dried casein. Fermented milk. Lactose and whey-butter. Margarine manufacture. Equipment of milk depots, butter, cheese and dairy factories.

FACTORY MANAGEMENT.—Factory routine. Organisation of labour. Handling of milk on arrival at the factory. Methods of dealing with the milk. Milk contracts. Dairy factory legislation.

DAIRY APPLIANCES AND MACHINERY.—Appliances used in the production and handling of milk, butter and cheese. Care and management of engines and boilers, dairy factory machinery, refrigerating machinery.

BUILDINGS.—Situation, construction and drainage of creameries, milk depots and dairy factories.

III.—CHEMISTRY.

(a) GENERAL CHEMISTRY AND PHYSICS.

CHEMISTRY.—Elements, compounds and mixtures. Chemical symbols, formulæ and equations. Acids, bases, salts: their distinctive properties. Acidity and alkalinity; their quantitative estimation. The Atmosphere: its constituents and impurities; influence on dairying operations. Water: its constitution; pure and natural waters; impurities in water and whence derived. Importance of a good water supply in dairying. General knowledge of elementary chemistry. Oxygen; hydrogen; carbon; nitrogen; phosphorus and sulphur; common metals; common acids; compounds of potassium, sodium, ammonium, calcium.

Elementary organic chemistry; sugar, milk sugar, starch, alcohol, acetic acid, formaldehyde, butyric acid, lactic acid, glycerine, saponification of fats; albumen, casein, pepsin.

PHYSICS.—The different forms of matter; solid, liquid, gaseous. Specific gravity and instruments for determining it. Temperature and methods of measuring it. Expansion; thermometric scales. Influence of temperature in dairy operations. Atmospheric pressure and its measurement. Hygrometry. Heat and its measurement; specific heat. Latent heat. Conduction. Convection. Radiation. Solution. Filtration. Distillation. Simple machines, such as levers, pulleys and light weighing machines.

(b) DAIRY CHEMISTRY.

CHEMISTRY OF MILK.—The nature, composition, properties and chemical constituents of milk. Microscopical appearances presented by milk. The influence of feeding. The changes which occur in the keeping of milk, and how produced. The natural and artificial souring of milk. Rennet, its nature and uses.

MILK PRODUCTS.—Physical and chemical changes involved in the making and keeping of butter and in the manufacture and ripening of cheese. Separated milk. Condensed milk. Fermented milk. Synthetic milk. The use of preservatives.

DAIRY ANALYSIS.—Analytical methods, their theory and practice. A general knowledge of the methods employed in the chemical analysis of milk, butter and cheese. Adulteration of milk, cream, butter and cheese, the ways in which adulteration is practised, the changes in composition thereby produced, and a general knowledge of the methods employed in detecting the same.

CHEMISTRY OF FEEDING.—The principal constituents of food materials and the functions they severally fulfil. The influence of food constituents on milk production. Assimilation and digestion. The manurial value of foods. Milk and milk products as foods.

N.B.—*Candidates are required to bring to the Oral Examination their Laboratory notebooks in sections* (a) *and* (b) *of this subject certified by their teachers as being the record of their Laboratory work carried out during the course.*

IV.—DAIRY BACTERIOLOGY.

GENERAL BACTERIOLOGY.—Bacteria; their form, classification, growth and reproduction. The microscope and its use. Staining and microscopic examination of bacteria. Methods of isolation and cultivation. Preparation of culture media. Fermentations and chemical changes produced by bacteria. Enzymes and their action. Effects of heat, cold, sterilisation, pasteurisation, disinfectants and preservatives on bacteria and enzymes. Bacteriological examination of water supplies.

BACTERIOLOGY OF MILK.—The changes produced by bacteria in milk. Useful forms and their functions. Harmful forms and their effects. Coagulation, discoloration, taints, &c. Bacteriological and other standards in relation to the cleanliness of milk.

MILK PRODUCTS.—The bacteria concerned in the ripening of cream and butter-making. 'Starters,' their preparation and management. The ripening of hard, soft and blue-veined cheese. Bacteria injurious to milk products, including condensed and dried milk.

DAIRY MYCOLOGY.—Moulds and yeasts in dairy practice. Their form, classification, growth and relation to dairy products.

N.B.—*Candidates are required to bring to the Oral Examination in this subject their Laboratory notebooks certified by their teachers as being the record of their Laboratory work carried out during the course.*

V.—DAIRY BOOK-KEEPING.

Reasons for keeping accounts on the farm and in the dairy factory.

General principles of double-entry book-keeping. Use of day-book, journal, ledger, cash-book, analysis cash-book, and petty-cash book. Preparation of profit and loss account, capital account and balance sheet. Adjustments necessary for the owner-occupier.

Valuations. Basis of valuations for accounting purposes on the farm and in the dairy factory. Dates for stocktaking.

Methods of accounting suitable for dairy farms and factories. Forms for milk-retailing, cheese-making, and butter-making.

Preparation of a cost account for milk production.

Interpretation and use of accounting results, with special reference to their practical application.

Opening a Bank account. Cheques, deposits, and overdrafts.

Assessment of the Farmer for Income Tax purposes.

VI.—PRACTICAL SKILL IN DAIRY WORK.

Candidates must be prepared—(1) to produce before the Examination a satisfactory certificate of proficiency in the milking of cows, signed by a practical Dairy Farmer, and to satisfy the Examiners by a practical test, if so required; (2) to churn and make into Butter a measured quantity of Cream; and (3) to make one Cheese of each of the following varieties: (1) Hard-pressed, of not less than 30 lb. (see Note to Reg. 8 (4)); (2) Veined or blue-moulded, of not less than 10 lb.; and (3) also to make one or other of the following Soft Cheeses: Cambridge, Camembert, Coulommier, or Pont l'Evêque.

WINNERS OF DIPLOMA IN 1937.

SCOTTISH CENTRE.

Diploma with Honours.

1st. **EDWARD DAWSON**, Whitestake Farm, New Longton, near Preston, Lancs.

2nd. **GEORGE ORD**, Field House, Lesbury, Northumberland.

Diploma.

SARAH MARGARET ATKINSON ARMSTRONG, Cormilligan, Tynron, Dumfriesshire.

JOHN ALLAN BIRCH, Club Nook, Barden, Bolton Abbey, near Skipton, Yorks.

JEAN CRAWFORD BLANE, 106 Prestwick Road, Ayr.

FLORENCE SAMSON BROADFOOT, "Glencairn," Helensburgh, Dumbartonshire.

JOHN ROBERT CLAPHAM, High Throston, West Hartlepool, Co. Durham.

JOHN GARDNER, Carskiey Home Farm, Southend, Campbeltown.

Walter James Ferguson Gardner, Woodside, Maybole, Ayrshire.
Robert Garside, Oak Bank, Grasmere, Westmorland.
Mary Gibson, 16 Raikes Parade, Blackpool, Lancs.
Jane Elizabeth Evans Girdwood, Blackethouse, Eaglesfield, Dumfriesshire.
John William Grant, Rothiemoon, Nethy Bridge, Inverness-shire.
Margaret Annie Gray, Dryhope, Yarrow, Selkirk.
Elizabeth Fenwick Hudson, Stobhill Farm, Morpeth, Northumberland.
William Johnstone, Lambriddon, Dalry, Ayrshire.
Ena Alison Jones, 82 Netherby Road, Trinity, Edinburgh.
Robert George Laing, Glengarriff, Helensburgh, Dumbartonshire.
James Lorimer, Glenview, Pennyvenie, Dalmellington, Ayr.
Isabella S. MacCallum, Red Lion Hotel, Buchlyvie, Stirling.
Alastair Macdonald, 8 Dundas Street, Edinburgh.
Margaret Jane Macdonald, Incheril, Kinlochewe, Achnasheen, Ross-shire.
Mary Margaret Walker MacGillivray, Heatherlea, Torphins, Aberdeenshire.
Dorothy Margaret Garden Macintyre, 28 Deemount Gardens, Aberdeen.
Lachlan MacKinnon, Hillcrest, Balephetrish, Isle of Tiree, Argyll.
Mary MacKinnon, Machair, Heanish, Isle of Tiree, Argyll.
Mona Margaret M'Lean, Croftallan, Nethy Bridge, Inverness-shire.
Anthony Ian M'Millan, Trelawney, Ipswich Road, Annerley, South Brisbane, Queensland, Australia.
Roberta Mary Runcie Mair, Glenmore, Oban.
Edith Milne, Dytach, Portsoy, Banffshire.
Phyllis Margaret Pyper, 23 Riselaw Crescent, Edinburgh.
Catherine Rose, Midcoul, Dalcross, Inverness-shire.
Catherine T. Steele, Brae of Monzie, Crieff, Perthshire.
Isabel Sinclair Stewart, 1 Overtoun Terrace, Dumbarton.
Margaret Love Stewart, Lyle Buildings, Kilmacolm, Renfrewshire.
James Struthers Symington, South Beach Manse, Saltcoats, Ayrshire.
Akbar Ali Tur, c/o The Cotton Research Botanist, Agricultural College and Research Institute, Lyallpur (Punjab), India.
John Carswell Warnock, South Howdon, Holytown, Lanarkshire.
Richard Harker Wharton, Mountbarrow Farm, near Ulverston, Lancs.

English Centre.

Diploma with Honours.

Kenneth Norton Russell, The University and British Dairy Institute, Reading.

Diploma.

Zoe Suzette Anning, Seale Hayne Agricultural College, Newton Abbot, Devon.
William Percival John Arthur, The University and British Dairy Institute, Reading.

Barbara Baddiley, Lancs. C.C. Dairy School, Hutton, Preston.
Rondesley Wilkins Baker, University College of Wales, Aberystwyth.
Oliver Baraclough, East Anglian Institute of Agriculture, Chelmsford.
Marian Elizabeth Barnham, The University and British Dairy Institute, Reading.
Margaret Barratt, The University and British Dairy Institute, Reading.
Maurice Agar Barrett, The University and British Dairy Institute Reading.
Barbara Barton, Studley College, Warwickshire.
John Corthan Morris Bearder, Midland Agricultural College, Sutton Bonington, Loughborough.
Barbara Ferguson Brodie, Dairy School for Scotland, Auchincruive, Ayr.
Helen Travis Brown, Studley College, Warwickshire.
Olive Bury, Lancs. C.C. Dairy School, Hutton, Preston.
Helen Rhoda Chapman, Lancs. C.C. Dairy School, Hutton, Preston.
Joan Campbell Cockburn, Lancs. C.C. Dairy School, Hutton, Preston.
Dorothy Lucy Grace Connett, Lancs. C.C. Dairy School, Hutton, Preston.
Sarah Lilian Corner, The University and British Dairy Institute, Reading.
Jane Evelyn Davies, University College of Wales, Aberystwyth.
May Davies, University College of Wales, Aberystwyth.
Anthony John Marsh Davison, The University and British Dairy Institute, Reading.
Gordon Sholto Douglas-Jones, The University and British Dairy Institute, Reading.
David Stanley Downey, University College of Wales, Aberystwyth.
Dorothy Frances Dryden, The University and British Dairy Institute, Reading.
Henry Owain Evans, University College of Wales, Aberystwyth.
Phyllis Leonie Ferguson-Walker, Lancs. C.C. Dairy School, Hutton, Preston.
Isobel Mary Gardiner, The University and British Dairy Institute, Reading.
Eluned Griffith, University College of Wales, Aberystwyth.
Norman William Griffiths, The University and British Dairy Institute, Reading.
Margaret E. Halliwell, Lancs. C.C. Dairy School, Hutton, Preston.
Frank Edwin Harnett, The University and British Dairy Institute, Reading.
Kenneth John Harris, The University and British Dairy Institute, Reading.
Dorothy Owen Harrison, Lancs. C.C. Dairy School, Hutton, Preston.
Leslie Hammond Heap, Dairy School for Scotland, Auchincruive, Ayr.
Megan Griffith Hughes, University College of Wales, Aberystwyth.

Dorothy Maude Irvine, The University and British Dairy Institute, Reading.
Dorothy Burgess Johnson, Lancs. C.C. Dairy School, Hutton, Preston.
Betty Monica Jones, University College of Wales, Aberystwyth.
Rebecca Hughes Jones, University College of Wales, Aberystwyth.
Kenneth Walter Kemp, East Anglian Institute of Agriculture, Chelmsford.
Ivor Ernest Ketteringham, Midland Agricultural College, Sutton Bonington, Loughborough.
Margaret Mary Lewis, The University and British Dairy Institute, Reading.
Marjory Lewis, Lancs. C.C. Dairy School, Hutton, Preston.
Herbert Edward Littlewood, Midland Agricultural College, Sutton Bonington, Loughborough.
Megan Olwen Lloyd, University College of Wales, Aberystwyth.
Millicent May Loveys, Seale Hayne Agricultural College, Newton Abbot, Devon.
John Collington Matthews, Midland Agricultural College, Sutton Bonington, Loughborough.
Leslie William Osborne, The University and British Dairy Institute, Reading.
John Pearce, The University and British Dairy Institute, Reading.
Patricia Mary Polding, Midland Agricultural College, Sutton Bonington, Loughborough.
Hannah Margaretta Powell, University College of Wales, Aberystwyth.
Kenneth James Rampling, East Anglian Institute of Agriculture, Chelmsford.
Kenneth Lambert Richards, Seale Hayne Agricultural College, Newton Abbot, Devon.
Catherine Roberts, University College of Wales, Aberystwyth.
Florence Elizabeth Stanley, The University and British Dairy Institute, Reading.
Doris Mary Stoodley, Studley College, Warwickshire.
Frances Elizabeth Wade, Midland Agricultural College, Sutton Bonington, Loughborough.
Tom March Wakerley, Midland Agricultural College, Sutton Bonington, Loughborough.
Percy Walker, Midland Agricultural College, Sutton Bonington, Loughborough.
Annie Mary Mildred Williams, University College of Wales, Aberystwyth.
Alice Jepson Yates, Lancs. C.C. Dairy School, Hutton, Preston.

Examination Papers of Past Years.

Copies of papers set at past Examinations in Dairying, so far as available, may be had on application. Price 6d. per set.

CERTIFICATES IN FORESTRY

In 1870 the Society instituted an Examination in Forestry, and granted First and Second-Class Certificates respectively to such students as attained a certain standard of proficiency in the following subjects. Candidates were required to possess a thorough acquaintance with the theory and practice of Forestry, and a general knowledge of the following branches of study, so far as these applied to Forestry: (*a*) the elements of Forest Botany and Forest Zoology: (*b*) the elements of Meteorology and Geology; (*c*) Forest Engineering; and (*d*) Arithmetic and Book-keeping.

Holders of the First-Class Certificate were entitled to become free Life Members of the Society.

In view of the institution of Examinations for Certificates and Diplomas in Forestry by the Royal Scottish Forestry Society, and by arrangement with that Society, the Board of Directors of the Highland and Agricultural Society of Scotland resolved in 1935 to cease holding further Examinations for the First and Second-Class Certificates, and that, in future, the granting of Certificates and Diplomas be left in the hands of the Royal Scottish Forestry Society.

The list of students who obtained the Highland and Agricultural Society's Certificates in Forestry prior to 1899 appears in the 'Transactions' for the year 1899. A further list of those obtaining Certificates between 1899 and 1935 inclusive appears in the 'Transactions' for the year 1935. The total number of Certificates granted since the commencement of the Examination in 1870 was as follows: First-Class, 43; Second-Class, 38.

VETERINARY CERTIFICATES AND MEDALS

The Society established a Veterinary Department in 1823, but by an arrangement made with the Royal College of Veterinary Surgeons, the Society's examination ceased in 1881. Holders of the Society's Veterinary Certificate are entitled to become members of the Royal College of Veterinary Surgeons on payment of certain fees, without being required to undergo any further examination. The number of students who passed for the Society's Certificate is 1183.

The Society gives annually a limited number of silver medals for Class competition to each of the two Veterinary Colleges in Scotland —the Royal (Dick) Veterinary College, Edinburgh, and the Glasgow Veterinary College, Glasgow.

CHEMICAL DEPARTMENT

Chemist to the Society—J. F. Tocher, D.Sc., LL.D., F.I.C.,
Crown Mansions, 41½ Union Street, Aberdeen.

The object of the Chemical Department is to promote the diffusion of a knowledge of Chemistry as applied to agriculture among the members of the Society, to carry out experiments for that purpose, to assist members who are engaged in making local experiments requiring the direction or services of a chemist, to direct members in regard to the use of manures and feeding-stuffs, to assist them to put the purchase of these substances under proper control, and in general to consider all matters coming under the Society's notice in connection with the Chemistry of Agriculture.

MEMBERS' PRIVILEGES IN RESPECT TO ANALYSES.

The Directors are anxious to take any steps in their power to expose the vendors of inferior fertilisers and feeding-stuffs, and the members can give them assistance in this by supplying to the Chemist, when sending samples for analysis, information as to the guarantee, if any, on which the goods were sold, and also as to the price charged.

These charges apply only to analyses made for agricultural purposes, and for the sole and private use of members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

Valuations of manures, according to the Society's scale of units, will be supplied if requested.

The Society will not be liable for payment of fees in respect of analyses for any member in excess of £5 for any one year, or £10 for any five consecutive years.

The undernoted fees are those payable by a member. These amounts represent only one-third of the total fee for any particular analysis, the other two-thirds being paid by the Society.

This scale does not apply to members whose subscriptions are in arrears.

Fertilisers and Feeding-Stuffs.

(1)	The determination of one ingredient in a single sample of a *manure* or of a *feeding-stuff*	3/6
(2)	The determination of two ingredients in a single sample of a *manure* or of a *feeding-stuff*	5/-
(3)	The complete analysis of a sample of a *manure* or of a *feeding-stuff*	10/-

For example—

For one ingredient only.

Linseed and other cakes, for oil *or* for albuminoids	3/6
Feeding meals, ground cereals, for oil *or* for albuminoids	
Bone meals, for nitrogen *or* for total phosphate	
Compound manures, for nitrogen *or* for soluble phosphate *or* for insoluble phosphate *or* for potash	
Superphosphate, for soluble phosphate *or* for insoluble phosphate	
Ground mineral phosphate, for insoluble phosphate *or* for citric soluble phosphate	
Slag phosphate, for insoluble phosphate *or* for citric soluble phosphate	

For two ingredients only.

Any two ingredients of a manure or of a feeding-stuff	5/-

For a complete analysis.

For manures, the proportions of nitrogen (nitrogen included as nitrates or as ammonia compounds), soluble phosphate, insoluble phosphate, potash; *For feeding-stuffs,* the proportions of oil, albuminoids, carbohydrates, iodine, mineral matter, fibre and moisture	10/-

(4)	Ground Limestone, for carbonic acid and calcium, two determinations	5/-
(5)	Ground Lime, for percentage of calcium oxide	3/6

AGRICULTURAL PRODUCTS.

(6)	Turnips, sugar beet, for total sugar	5/-
(7)	Turnips, sugar beet, for oil, albuminoids, sugar, mineral matter, fibre and moisture	10/-
(8)	Grass, hay, ensilage, grain, &c., for oil, albuminoids, carbohydrates, mineral matter, fibre and moisture	10/-
(9)	Grain, for carbohydrates and moisture	5/-

MILK AND MILK PRODUCTS.

(10)	*Milk,* fresh, for butter fat only, by Gerber process	1/-
(11)	*Milk,* fresh, for butter fat, by Gerber, and solids not fat	2/6
(12)	*Milk,* sour sample, for butter fat, and solids not fat. Soxhlet extraction and Government Laboratory method for sour sample	5/-
(13)	*Milk,* for preservatives, borates, sulphur dioxide, hydrogen peroxide, formalin	5/-
(14)	*Butter,* for true butter fat and moisture (Reichert), for genuineness	5/-
(15)	*Butter,* for true butter fat (Reichert), moisture, foreign fat, preservatives	7/6

Water and Liquid Substances.

Cases containing bottles for water samples and instructions for sampling are sent from the laboratory on application.

(16)	Supply of water at farm, for total solids, free ammonia, albuminoid ammonia, nitrites, nitrates, hardness, for fitness for domestic use or potability	12/6
(17)	Supply of water at farm, for potability as above, and for proportions of mineral constituents, lead, copper, acidity pH value, action of water on lead (plumbo solvency), action of water on copper	£1
(18)	Farm-yard manure, liquid manure, for nitrogen, potash, phosphates, and proportion of other mineral substances	£1

Miscellaneous.

(19)	Feeding oils and fats, for composition and quality	10/-
(20)	Search for proportion of arsenic in feeding-stuff	10/-
(21)	Search for proportion of lead in feeding-stuff	10/-
(22)	Search for arsenic or any one poison in feeding-stuff	10/-
(23)	Search for proportion of any one poison in viscera	10/-
(24)	Search for poisons in food or in viscera, and proportion of poison found	£1 10/-

(*Veterinary surgeons are not entitled to have searches made for poisons in food or viscera under the Society's scheme for clients who are not members of the Society.*)

(25)	Proportion of arsenic in sheep dips or insecticides	10/-
(26)	Proportion of carbolic acid in sheep dips or insecticides	5/-
(27)	Proportion of tar acids in sheep dips or insecticides	10/-
(28)	Insecticides, foot rot pastes and other agricultural remedies for live stock and farm produce	£1

Samples should be sent (carriage paid) to Dr J. F. Tocher,
Crown Mansions, 41½ Union Street, Aberdeen.

INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

Manures.

Any method of sampling mutually agreed upon between buyer and seller may be adopted, but the following method is recommended as a very complete and satisfactory one: Four or more bags should be selected for sampling. Each bag is to be emptied out separately on a clean floor, worked through with the spade, and one spadeful taken out and set aside. The four or more spadefuls thus set aside are to be mixed together until a uniform mixture is obtained. Of this mixture one spadeful is to be taken, spread on paper, and still more thoroughly mixed, any lumps which it may contain being broken down with the hand. Of this mixture two samples of about half a pound each should be taken by the purchaser or his agent, in the presence of the seller or his agent or two witnesses (due notice having been given to the seller of the time and place of sampling), and these samples should be taken as quickly as possible, and put into bottles or tin cases to prevent loss of moisture, and having been labelled, should be sealed by the samplers—one or more samples to be retained by the purchaser, and one to be sent to the Chemist for analysis.

FEEDING-STUFFS.

Samples of feeding-stuffs which are in the form of meal may be taken in a similar manner to that mentioned above.

Samples of cake should be taken by selecting four or more cakes from the bulk. These should be nutted to a size not larger than walnuts. The nutted cake should then be thoroughly mixed and samples of not less than one pound each taken from it. The samples should be put into bottles or tins, sealed up, and labelled. One sample should be sent to the Chemist, and one or more duplicates retained by the purchaser.

VEGETABLE PRODUCTS.

Turnips, &c., at least 50 bulbs carefully selected as of fair average growth.

Hay, straw, ensilage, &c., should be sampled from a thin section cut across the whole stack or silo, and carefully mixed; above 2 lb. weight is required for analysis.

Grain should be sampled like manures.

Grass should be representative of the whole field; about 5 lb. weight is required for analysis.

DAIRY PRODUCE.

Milk.—Samples of milk from individual cows should be taken direct from the milk-pail after complete milking. Average samples from a number of cows should be taken immediately after milking. Specify whether the sample is morning or evening milk, or a mixture of those. Samples to be tested for adulteration should not be drawn from the bottom or taken from the top of standing milk, but they should be ladled from the vessel after the milk has been thoroughly mixed. Samples of milk should be sent immediately to the Chemist.

For most purposes a half-pint bottle of milk is a large enough sample.

Butter.—About quarter-pound samples are required.

WATERS.

When the water is from a well, it should be pumped for some minutes before taking the sample.

If the well has been standing unused for a long time, it should be pumped for some hours, so that the water may be renewed as far as possible.

If the well has been newly dug or cleaned out, it should be pumped as dry as possible, daily, for a week before taking the sample.

Water from cisterns, tanks, ponds, &c., should be sampled by immersing the bottle entirely under the water, and holding it, neck upwards, some inches below the surface. *Water from the surface should not be allowed to enter the bottle.*

Spring or stream water should not be sampled in very wet weather, but when the water is in ordinary condition. Such waters should be sampled by immersing the bottle. If not deep enough for that purpose, a perfectly clean cup should be used for transferring the water to the bottle.

When the bottle has been filled the stopper should be rinsed in the water before replacing it.

Interference with or disturbance of wells or springs, or the ground in their immediate vicinity, must be carefully avoided during sampling, and for at least twenty-four hours before it.

After a sample has been taken, it should be sent to the Chemist as speedily as possible.

A description of the source and circumstances of the water should accompany the sample, as the interpretation of the analytical results depends to some extent on a knowledge of such particulars.

N.B.—Stone jars and old wine bottles are unsuitable for conveying samples. Winchester quarts chemically cleaned should be obtained from Dr J. F. Tocher, Crown Mansions, 41½ Union Street, Aberdeen.

COMPOSITION AND CHARACTERISTICS OF MANURES AND FEEDING-STUFFS.

(*See* '*Transactions,*' *Fifth Series, vol. xi.*, 1899.)

FORMS OF GUARANTEE

Guarantee of Manure.

I guarantee that the manure called......................and sold by me to ....contains—

Soluble phosphoric acid . . . .per cent.
Insoluble phosphoric acid . . ..per cent.
Potash . . . .per cent.
Total nitrogen . . . .per cent.

Signature of seller.......................

Date..................19...

Guarantee of Feeding-Stuff.

I guarantee that the feeding-stuff called...............and sold by me to ....contains—

Albuminoids . . . .per cent.
Oil . . . .per cent.
Fibre . . . .per cent.

Signature of seller.......................

Date.................19...

PRICES OF FEEDING-STUFFS FOR SEASON 1937

(Cash Prices as fixed on 2nd June. These prices are subject to variation from month to month or oftener.)

(For Cash Prices as fixed on 3rd February 1937, see previous volume.)

Name of Feeding Stuff	Price per Ton	Name of Feeding Stuff	Price per Ton
Linseed Cake (Home) 8% Oil, [illegible]% Albuminoids	£[illegible] 10 0	Medium Bran (Leith)	£7 2 6
Linseed Cake (Imported)	5 17 6	,, ,, (Glasgow)	7 0 0
Cotton Seed Cake (Egyptian) (undecorticated), Home, 4½% Oil, [illegible]% Albuminoids	6 7 6	[illegible] (Lime)	5 0 0
Cotton Seed Cake (Egyptian) (undecorticated) Imported	6 0 0	Dried Distillery Grains	[illegible] 1[illegible] 0
Ground Nut Cake—		Dried Brewers Grain	[illegible]
Decorticated (Expeller) 8% Oil, [illegible]% Albuminoids 12% Fibre	5 5 0	Feeding Treacle	[illegible] 0 0
Decorticated (Expeller) 8% Oil, 50% Albuminoids, 8% Fibre	8 10 0	Locust Beans (Kibbled)*	[illegible] 15 0
Decorticated Cotton Seed Cake, 8% Oil, 42% Albuminoids	5 10 0	Maize (Round Plate)*	[illegible] 0 0
Rice Bran Meal	7 0 0	,, (Flaked)*	7 1 0
Broad Bran	7 12 6	Beans (Imported China) (Glasgow)	[illegible]
		Bean Meal	5 10 0
		Soya Bean Meal (extracted)	9 10 0
		Home Oats (Feeding)	[illegible] 0 0
		White Fish Meal (Aberdeen)	11 10 0
		,, ,, (Leith)	11 10 0
		,, ,, (Glasgow)	14 10 0
		Ground Barley	9 1[illegible] 0
		Skim Milk Powder	24 0 0

Note.—Prices free on rail, Leith, unless where otherwise stated.

* In Railway Sacks.

PRICES OF FERTILISERS AND FEEDING-STUFFS FOR SEASON 1938.

(Cash Prices as fixed on 2nd February. These prices are subject to variation from month to month or oftener.)

SUPERPHOSPHATES.

ITEM TO BE VALUED	PRICES FOR THE UNDERNOTED PERCENTAGES.			
PHOSPHORIC ACID DISSOLVED TRICALCIUM PHOSPHATE DISSOLVED	13·75 30	16·0 35	18·0 39·3	21·0 45·9
February Price per ton	£2 19 0	£3 4 0	£3 9 0	£3 16 6
Price per Unit	4/3½	4/-	3/10	3/7½

FERTILISERS.

(Other than Superphosphates.)

Name of Fertiliser.	Guarantee.	Price per Ton.	Price per Unit.
		£ s. d.	s. d.
Sulphate of Ammonia (neutral)* . .	20·6 % Nitrogen	7 12 6	7 4¾
,, ,, (March-June)	,,	7 14 0	7 5¾
Basic Slag †‡	14 % Total Phos. Acid =30·60 % Tric. Phos.	2 11 0	3 7¼
,, ,, †‡	15 % Total Phos. Acid =32·75 % Tric. Phos.	2 12 6	3 6
,, ,, †‡	15 75 % Total Phos. Acid =34·35 % Tric. Phos.	2 15 0	3 6
Potassic Slag	12 % Phos. Acid =26·21 % Tric. Phos. 6 % Potash	3 15 0	P 4 3¼ Pot. 3 11½
Bone Meal (Home and Indian) .	4 % Nit., 20 % Phos. Acid =43·68 % Tric. Phos.	7 5 0	N 16 1¼ P 4 0¼
Steamed Bone Flour	0·75 % Nit., 27·5 % Phos. Acid =60·06 % Tric. Phos	5 5 0	N 13 9¼ P 3 5½
Calcium Cyanamide (Feb.) ‖ . . .	20·6 % Nitrogen	7 13 9	7 5½
,, ,, (March) ‖ . . .	,,	7 15 0	7 6¼
,, ,, (April-June) ‖ . .	,,	7 16 3	7 7
Ground Mineral Phosphate § . .	26 % Phos. Acid =56·79 % Tric. Phos.	2 17 6	2 2½
,, ,, ,, § . .	34 % Phos. Acid =74·26 % Tric. Phos.	3 17 6	2 3¼
Phosphatic Lime (Belgian) ¶ . .	9 % Phos. Acid =19·66 % Tric. Phos., 65 % Carb. of Lime	2 5 0	P 2 7½ Carb. of Lime 0 4
Potassic Mineral Phosphate . .	6 % Pot., 21 % Phos. Acid =45·87 % Tric. Phos.	3 8 9	P 2 3½ Pot. 3 5
,, ,, ,, . .	10 % Pot , 18 % Phos. Acid =39·30 % Tric. Phos.	3 16 3	P 2 4 Pot 3 3¼
Nitrate of Soda*	16 % Nitrogen	8 0 0	10 0
Nitro Chalk *	15·5 % ,,	7 10 6	9 8½
Kainit	14 % Potash	3 0 0	4 3½
Potash Salts	30 % ,,	5 0 0	3 4
Sulphate of Potash	48·5 % ,,	9 17 6	4 0¾
Muriate of Potash	50 % ,,	8 5 0	3 3½
Concentrated Fertiliser ** . .	10·3 % Nitrogen 10·3 % Sol. P.A. 20 7 % Potash	11 10 6	N 7 6 SPA 4 3 Pot 4 0

Ground Lime, in bags (65 % calcium oxide), at Dufftown 39/- per ton; (60 % calcium oxide) at Grange, 39/- per ton; (70 % calcium oxide) at Dunbar, 32/6 per ton; (75 % calcium oxide) at Cults, 33/- per ton; at Fushiebridge, 35/- per ton.

English Ground Lime (85 % calcium oxide), to Aberdeen, 54/- per ton.

English Ground Lime (95 % calcium oxide), at Buxton, f.o.r. 28/- per ton, in bags; or to Edinburgh, 51/3 per ton; to Lanark, 49/3 per ton; to Stirling, 53/9 per ton; to Dumfries, 47/- per ton.

Ground Limestone (96 % calcium carbonate), at Buxton, f.o.r. in bulk, 22/- per ton; or to Edinburgh, 37/4 per ton; to Lanark, 36/9 per ton; to Stirling, 38/6 per ton; to Dumfries, 35/4 per ton; in six-ton lots in bulk. 80 % passing through prescribed sieve.

The prices for all fertilisers are cash prices for two-ton lots in bags at Leith or Glasgow, unless otherwise stated. Where prices are quoted carriage paid, there is a reduction, in certain cases, of from 5/- to 10/- per ton when lifted Ex Sellers' stores.

* Carriage paid to any railway station in six-ton lots. Four-ton lots 1/- more per ton.

† Manufacturers' allowance as adjusted with the Land Fertility Committee—viz., 6d. per ton on all grades up to and including 12 %; over 12 % up to and including 15·75 %, 9d. per ton; over 15·75 %, 1/- per ton.

‡ The fineness of Basic Slag is such that 80 % of the powder will pass through the prescribed sieve.

‖ Five-ton lots carriage paid to nearest station. § 90 % passing through prescribed sieve.

¶ Price at Dundee. ** Price for 6 ton lots including cost of mixing, &c. Other similar Concentrated Fertilisers are available.

N.B.—When these units are multiplied by the percentages in the analysis of a Manure, they will produce a value representing very nearly the **cash price** *per ton at which TWO TONS may be bought in fine sowable condition at Leith or Glasgow. Larger purchases may be made on more favourable terms.*

FEEDING-STUFFS.

Name of Feeding-Stuff.	Price per Ton. £	s.	d.
Linseed Cake (Home), 8% Oil, 28% Albuminoids	10	5	0
Linseed Cake (Imported), 8% Oil, 30% Albuminoids	9	12	6
Cotton Seed Cake (Egyptian) (undecorticated) at Leith, 4·5 % Oil, 22% Albuminoids	5	12	6
Ground Nut Cake—Leith—			
Decorticated (Expeller) 8% Oil, 42 % Albuminoids, 13 % Fibre	7	17	6
Decorticated (Expeller), 8% Oil, 46 % Albuminoids, 8 % Fibre	8	2	6
Decorticated Cotton Seed Cake—8% Oil, 40% Albuminoids	8	10	0
Decorticated Cotton Seed Meal—7% Oil, 42% Albuminoids	8	5	0
Rice Bran Meal	7	0	0
Broad Bran (Giant)	8	15	0
Medium Bran	8	5	0
Parings or Wheatings	8	5	0
Dried Distillery Grains	7	2	6
,, Brewers' Grains	6	5	0
Feeding Treacle	6	0	0
Locust Beans (Kibbled)*	6	15	0
Maize (Round Plate)*	8	0	0
,, (Flaked)† (Leith & Glasgow)	8	17	6
Beans (Imported China) (Glasgow)	9	15	0
Bean Meal	10	12	6
Soya Bean Meal (extracted)	9	15	0
Home Oats (Feeding)	7	10	0
White Fish Meal (Aberdeen)	14	15	0
,, ,, (Leith)	15	2	6
,, ,, (Glasgow)	15	5	0
Ground Barley	9	10	0
Skim Milk Powder ‡	28	0	0
Dried Grass Meal (Perth)	8	10	0

* In Railway Sacks. † Including bags. ‡ In two-ton lots delivered.

CLASSIFICATION OF MANURES.

BONE MEALS	Genuine Bone Meal contains about 20 per cent Phosphoric Acid equal to 43·7 per cent Tricalcium Phosphate, and about 4 per cent Nitrogen. If phosphates are low, Nitrogen will be high, and conversely.
STEAMED BONE FLOUR	Ground to flour, and containing 27·5 per cent Phosphoric Acid equal to about 60 per cent Phosphates and about ·8 per cent Nitrogen.
MIXTURES AND COMPOUND MANURES	To be valued according to the following units: Nitrogen, 7/6; Soluble Phosphoric Acid, 4/3; Insoluble Phosphoric Acid, 3/-; and Potash, 4/-. The value so arrived at will be the value at Leith or Glasgow, exclusive of the cost of mixing, bags and bagging, which may be taken on an average at about 20/- per ton.
DISSOLVED BONES	Must be pure—*i.e.*, containing nothing but natural bones and Sulphuric Acid.

INSTRUCTIONS FOR VALUING MANURES.

The unit used for the valuation of manures is the hundredth part of a ton, and as the results of analyses of manures are expressed in parts per hundred, the percentage of any ingredient of a manure when multiplied by the price of the unit of that ingredient represents the value of the quantity of it contained in a ton.

As an example take muriate of potash; a good sample (see p. 44) will be guaranteed to contain 50 per cent of oxide of potash. All potash manures are valued according to the amount of potash (oxide of potash) they yield, and muriate of potash yields 50 per cent of potash (K_2O)—*i.e.*, 50 units per ton; and as a ton of muriate of potash costs £8, 5s., the price of the unit is the fiftieth part of that—viz., 3/3½. If on analysis a sample of muriate of potash guaranteed to contain 50 per cent of potash is found to contain only 47 per cent, the price per ton will be 9/10 (three times 3/3½) less—viz., £7, 15s. 2d.

Similarly with all other manures, the price per unit is derived from the price per ton of a sample of good material up to its guarantee, and therefore the proper price per ton of a manure is found by multiplying the price of the unit of the valuable ingredient by the percentage as found by analysis. If a manure contains more than one valuable ingredient, the unit value of each ingredient is multiplied by its percentage, and the values so found when added together give approximately the price per ton of the manure.

Nitrate of soda contains no ammonia, but it contains nitrogen, and 14 units of nitrogen are equivalent to 17 units of ammonia.

The commercial values of manures are determined by means of the UNITS in the following manner:—

Take the results of analysis of the manure, and look for the following substances:—

Phosphates dissolved (or soluble phosphoric acid) Phosphates undissolved (or insoluble phosphoric acid) Total phosphoric acid Nitrogen Potash	No other items but these are to be valued.

Should the results of analysis or the guarantee not be expressed in that way, the chemist or the seller should be asked to state the quantities in these terms.

Suppose the manure is ground mineral phosphate—

The proportion of phosphate present in a sample guaranteed to contain 26 per cent phosphoric acid, may be 24 per cent phosphoric acid. The price per unit of phosphoric acid in ground mineral phosphate (26 per cent grade) is 2s. 2½d. The value of ground mineral phosphate containing 24 per cent phosphoric acid is therefore 24 times 2s. 2½d., equal to £2, 13s. per ton.

Suppose the manure is a superphosphate—say an ordinary superphosphate, 15 per cent soluble phosphoric acid,—the price per unit of phosphoric acid in superphosphate (16 per cent grade) is 4/- at Leith.

It is valued thus—

Soluble phosphoric acid. 15 times 4/-, equal to £3, 0s. 0d.

Insoluble phosphoric acid is not valued in a superphosphate.

Suppose the manure is a compound fertiliser containing 4 per cent nitrogen, 7 per cent soluble phosphoric acid, 3 per cent insoluble phosphoric acid, and 4 per cent potash. From the units given on p. 45 for "Mixtures and Compound Manures," the value of this compound fertiliser is obtained as follows:—

The value of the—

Nitrogen will be	£1	10	0	per ton
Soluble phosphoric acid will be .	1	9	9	„
Insoluble phosphoric acid will be	0	9	0	„
Potash will be	0	16	0	„
	£4	4	9	

The value of this manure will thus be £4, 4s. 9d. per ton, exclusive of the cost of mixing, bags and bagging, which may be taken on an average at about 20/- per ton.

Note.—The units have reference solely to the MARKET PRICES of MANURES, and not to their AGRICULTURAL VALUES.

TABLE OF COMPENSATION VALUES FOR 1938.

TABLE SHOWING THE VALUE OF FEEDING-STUFFS AS MANURE PER TON, AND THE COMPENSATION VALUE PER TON OF FOOD CONSUMED, BASED ON THE AVERAGE UNIT PRICES OF FERTILISERS FOR 1938.

The following is a Table showing (under Section A) the average proportions of digested nitrogen, undigested nitrogen, phosphoric acid, and potash present in the feeding-stuffs named. The Table also shows the value per unit of nitrogen (digested and undigested), phosphoric acid, and potash, the prices per unit being the value per unit for compound manures prevailing for 1938. Under Section B of the Table is shown the compensation value per ton of food consumed for each of the feeding-stuffs named, based on the unit prices for 1938. Column (1) of Section B of the Table shows the value per ton recovered in dung; Col. (2) of the same section shows the value of the lasting part of dung per ton; while the remaining three columns show the residual values per ton after one crop, two crops, and three crops have been removed.

In accordance with the decision arrived at by the Committee appointed by a representative meeting of Scottish agriculturists, who reported in September 1917 on the "Compensation for Manurial Improvements and Cumulative Fertility," under the Agricultural Holdings (Scotland) Act, 1908, the value of undigested nitrogen per ton as manure is calculated as being 70 per cent of the value of digested nitrogen. The residual value, after one crop has been removed, is taken as one-half of the original residual value. Residual values, after one crop has been removed, are reduced by one-half after each crop.

Foods.	Value per					
	Digested Nitrogen.			Undigested Nitrogen.		
	Per cent in food. (1)	Value at 7s. 6d. per unit. (2)	Two-fifths value to manure. (3)*	Per cent in food. (4)	*Value at 5s. 3d. per unit. (5)	Three-fourths value to manure. (6)
		s. d.	s. d.		s. d.	s. d.
Cotton-cake, decorticated .	5·92	44 5	17 9	0·98	5 2	3 11
Cotton-cake, undecorticated .	2·73	20 6	8 2	0·81	4 3	3 2
Linseed cake	4·08	30 7	12 3	0·67	3 6	2 8
Linseed	3·28	24 7	9 10	0·32	1 8	1 3
Soya-bean cake	6·10	45 9	18 4	0·75	3 11	2 11
Palm-nut cake	1·88	14 1	5 8	0·62	3 3	2 5
Cocoa-nut cake	2·65	19 11	8 0	0·75	3 11	2 11
Earth-nut cake	6·86	51 5	20 7	0·76	4 0	3 0
Rape cake	3·97	29 9	11 11	0·93	4 11	3 8
Beans	3·48	26 1	10 5	0·52	2 9	2 1
Peas	3·10	23 3	9 4	0·50	2 8	2 0
Wheat	1·49	11 2	4 6	0·31	1 8	1 3
Barley	1·16	8 8	3 6	0·49	2 7	1 11
Oats	1·52	11 5	4 7	0·48	2 6	1 11
Maize	1·22	9 2	3 8	0·48	2 6	1 11
Rice-meal	1·08	8 1	3 3	0·82	4 4	3 3
Locust beans	0·82	6 2	2 6	0·35	2 0	1 6
Malt	1·34	10 1	4 0	0·36	1 11	1 5
Malt culms	3·12	23 5	9 4	0·78	4 1	3 1
Bran	1·98	14 10	5 11	0·52	2 9	2 1
Brewers' and distillers' grains (dried)	2·34	17 7	7 0	0·96	5 0	3 9
Brewers' and distillers' grains (wet)	0·59	4 5	1 9	0·22	1 2	0 11
Dried distillery dreg . .	3·45	25 11	10 4	1·86	9 9	7 4
Clover hay	1·21	9 1	3 8	1·03	5 5	4 1
Meadow hay	0·88	6 7	2 8	0·62	3 3	2 5
Wheat straw . . .	0·02	0 2	0 1	0·43	2 3	1 8
Barley straw	0·10	0 9	0 4	0·30	1 7	1 2
Oat straw	0·17	1 3	0 6	0·33	1 9	1 4
Mangolds	0·15	1 2	0 6	0·07	0 4	0 3
Swedes	0·16	1 2	0 6	0·09	0 5	0 4
Turnips	0·13	1 0	0 5	0·05	0 3	0 2
Fish-meal	8·08	60 7	24 3	0·90	4 9	3 7

* See last paragraph of explanatory note to the Table.

A. TON AS MANURE.						B. COMPENSATION VALUE PER TON OF FOOD CONSUMED.				
Phosphoric Acid.			Potash.			† (1) Value recovered in dung.	‡ (2) Value of lasting part of dung.	Residual Value after		
Per cent in food (7)	Value at 4s. 3d. per unit. (8)	Three-fourths value to manure. (9)	Per cent in food. (10)	Value at 4s. per unit. (11)	Three-fourths value to manure. (12)	(13) *	(14)	* (3) One crop. (15)	* (4) Two crops. (16)	* (5) Three crops. (17)
	s. d.	s. d.		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
3·10	13 2	9 11	2·00	8 0	6 0	37 7	19 10	9 11	5 0	2 6
2·00	8 6	6 5	2·00	8 0	6 0	23 9	15 7	7 10	3 11	1 11
2·00	8 6	6 5	1·40	5 7	4 2	25 6	13 3	6 8	3 4	1 8
1·54	6 7	4 11	1·37	5 6	4 1	20 1	10 3	5 2	2 7	1 3
1·30	5 6	4 2	2·20	8 10	6 7	32 0	13 8	6 10	3 5	1 9
1·20	5 1	3 10	0·50	2 0	1 6	13 5	7 9	3 11	1 11	1 0
1·40	5 11	4 5	2·00	8 0	6 0	21 4	13 4	6 8	3 4	1 8
2·00	8 6	6 5	1·50	6 0	4 6	34 6	13 11	7 0	3 6	1 9
2·50	10 8	8 0	1·50	6 0	4 6	28 1	16 2	8 1	4 1	2 0
1 10	4 8	3 6	1·30	5 2	3 11	19 11	9 6	4 9	2 5	1 2
0·85	3 7	2 8	0·96	3 10	2 11	16 11	7 7	3 10	1 11	0 11
0·85	3 7	2 8	0·53	2 1	1 7	10 0	5 6	2 9	1 5	0 8
0·75	3 2	2 5	0·55	2 2	1 8	9 6	6 0	3 0	1 6	0 9
0·60	2 7	1 11	0·50	2 0	1 6	9 11	5 4	2 8	1 4	0 8
0·60	2 7	1 11	0·37	1 6	1 1	8 7	4 11	2 6	1 3	0 7
0·60	2 7	1 11	0·37	1 6	1 1	9 6	6 3	3 2	1 7	0 9
0·80	3 5	2 7	0·80	3 2	2 5	9 0	6 6	3 3	1 8	0 10
0·80	3 5	2 7	0·60	2 5	1 10	9 10	5 10	2 11	1 6	0 9
2·00	8 6	6 5	2·00	8 0	6 0	24 10	15 6	7 9	3 11	1 11
2·70	11 6	8 8	1·45	5 10	4 4	21 0	15 1	7 7	3 9	1 11
1 61	6 10	5 2	0·20	0 10	0 7	16 6	9 6	4 9	2 5	1 2
0·42	1 9	1 4	0·05	0 2	0 2	4 2	2 5	1 3	0 7	0 4
0·44	1 10	1 5	0·22	0 11	0 8	19 9	9 5	4 9	2 4	1 2
0·57	2 5	1 10	1·50	6 0	4 6	14 1	10 5	5 3	2 7	1 4
0·40	1 8	1 3	1·60	6 5	4 10	11 2	8 6	4 3	2 2	1 1
0·24	1 0	0 9	0·80	3 2	2 5	4 11	4 10	2 5	1 2	0 7
0·18	0 9	0 7	1·00	4 0	3 0	5 1	4 9	2 5	1 2	0 7
0·24	1 0	0 9	1·00	4 0	3 0	5 7	5 1	2 7	1 3	0 8
0·07	0 4	0 3	0·40	1 7	1 2	2 2	1 8	0 10	0 5	0 3
0·06	0 3	0 2	0·22	0 11	0 8	1 8	1 2	0 7	0 4	0 3
0·05	0 3	0 2	0·30	1 2	0 11	1 8	1 3	0 8	0 4	0 2
7·24	30 9	23 1	0·50	2 0	1 6	52 5	28 2	14 1	7 1	3 6

† The figures in column (13) are the sum of columns (3), (6), (9), and (12).

‡ The figures in column (14) are the figures in column (13) from which the corresponding figures in column (3) have been subtracted.

BOTANICAL DEPARTMENT

Consulting Botanist to the Society—(vacant).

The Society has fixed the following scale of charges for the examination of plants and seeds for the *bona fide* and individual use and information of members of the Society (not being seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination required, and to quote its number as appearing in the undernoted Scale of Charges. The charge for examination must be paid at the time of application. and the carriage or postage on all parcels must be prepaid.

Scale of Charges for Examinations.

1. A report on the purity, amount, and nature of foreign materials, and the germinating power of a sample of seed . . 1s.
2. Determination of the species of any weed or other plant, or of any vegetable parasite, with a report on its habits and the means for its extermination or prevention . . . 1s.
3. Report on any disease affecting farm crops . . . 1s.
4. Determination of the species of any natural grass or fodder plant, with a report on its habits and pasture or feeding value . . . . 1s.

The Consulting Botanist's Reports are furnished to enable members —purchasers of seeds and corn for agricultural or horticultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes by seedsmen or otherwise.

Purchase of Seeds.

The purchaser should obtain from the vendor, by invoice or other writing, the proper designation of the seeds bought, with a guarantee of the percentage of purity and germination, and of its freedom from ergot, and in the case of clover, from the seeds of dodder or broom-rape.

It is strongly recommended that the purchase of *prepared mixtures* of seeds should be avoided. The different seeds should be purchased separately and mixed by the farmer: mixtures cannot be tested for germination.

The Sampling of Seeds.

The utmost care should be taken to secure a fair and honest sample. This should be drawn from the bulk delivered to the purchaser, and not from the sample sent by the vendor.

When legal evidence is required, the sample should be taken from the bulk, and placed in a sealed bag in the presence of a witness. Care should be taken that the sample and bulk be not tampered with after delivery, or mixed or brought in contact with any other sample or bulk.

At least one ounce of grass and other small seeds should be sent, and two ounces of cereals and the larger seeds. When the bulk is obviously impure the sample should be at least double the amount specified. Grass seeds should be sent at least four weeks, and seeds of clover and cereals two weeks, before they are to be used.

The exact name under which the sample has been sold and purchased should accompany it.

Reporting the Results.

The Report will be made on a schedule in which the nature and amount of impurities will be stated, and the number of days each sample has been under test, with the percentage of the seeds which have germinated.

"Hard" clover seeds, though not germinating within the time stated, will be considered good seeds, and their percentage separately stated.

The impurities in the sample, including the chaff of the species tested, will be specified in the schedule, and only the percentage of the pure seed of that species will be reported upon; but the REAL VALUE of the sample will be stated. The Real Value is the combined percentages of purity and germination, and is obtained by multiplying these percentages and dividing by 100: thus in a sample of Meadow Fescue having 88 per cent purity and 95 per cent germination, 88 multiplied by 95 gives 8360, and this divided by 100 gives 83·6, the Real Value.

Selecting Specimens of Plants.

The whole plant should be taken up and the earth shaken from the roots. If possible the plants should be in flower or fruit. They must be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They must be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

NOTE.—Members are reminded that Seeds may now be tested at the Department of Agriculture for Scotland Seed-testing Station. Samples should be addressed to T. Anderson, Esq., Seed-testing Station, East Craigs, Corstorphine, Edinburgh.

ENTOMOLOGICAL DEPARTMENT

Consulting Zoologist to the Society—A. E. Cameron, M.A., D.Sc., Department of Agricultural and Forest Zoology, University of Edinburgh, 10 George Square, Edinburgh.

REPORTS ON THE ANIMAL ENEMIES OF CROP PLANTS AND LIVE STOCK (INCLUDING POULTRY).

The Consulting Zoologist is prepared to send to any Member of the Society a Report on damage to or diseases of plants and animals due to animal agency (Insects, Mites, Worms, Snails, Slugs, Birds, and the Smaller Mammals), and will advise Members regarding insects or allied animals which, in any stage of their development, infest—

(*a*) Farm crops.
(*b*) Stored grain.
(*c*) Garden and greenhouse plants.
(*d*) Fruit and fruit trees.
(*e*) Forest trees and stored timber.
(*f*) Live stock (including poultry).

Any Member consulting Dr Cameron should give him full particulars of the damage or disease upon which his advice is desired. In addition, there should be sent to him specimens of the injured plants, or the injured parts of plants, &c., as well as specimens of the insects or animals believed to be the cause of the injury.

Specimens should be sent in tin or wooden boxes, or in quills, in order to prevent injury in transmission.

The Directors have fixed the fee payable by Members to Dr Cameron at 2s. 6d. for each case upon which he is consulted : this fee should be sent to him along with the application for information.

Letters and parcels (carriage or postage paid) should be addressed to A. E. Cameron, Esq., M.A., D.Sc., Department of Agricultural and Forest Zoology, University of Edinburgh, 10 George Square, Edinburgh.

PREMIUMS OFFERED

1938

GROUP I.—REPORTS.

GENERAL REGULATIONS.

1. It is to be distinctly understood that the Society is not responsible for the views, statements, or opinions of any of the writers whose papers are published in the 'Transactions.'

2. All reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter, similarly marked, containing the name and address of the reporter—initials must not be used.

3. No sealed letter, unless belonging to a report found entitled to the Premium offered, or a portion of it, will be opened without the author's consent.

4. Reports for which a Premium, or a portion of a Premium, has been awarded, become the property of the Society, and cannot be published in whole or in part, or circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors if applied for within twelve months.

5. The Society is not bound to award the whole or any part of a Premium.

6. All reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded or accepted. Weights and measurements must be indicated by the imperial standards.

7. The Directors, before or after awarding a Premium, shall have power to require the writer of any report to verify the statements made in it.

8. The decisions of the Board of Directors are final and conclusive as to all matters relating to Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

9. The Directors will welcome papers from any Contributor on any suitable subject, whether included in the Premium List or not; and if the topic and the treatment of it are both approved, the writer may be remunerated and his paper published.

SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

FOR APPROVED REPORTS.

1. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purpose chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

2. Approved Reports on other suitable subjects. To be lodged by 1st November in any year.

SECTION 2.—ESTATE IMPROVEMENTS.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive Improvement—The Gold Medal, or Ten Pounds. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Minor Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements, as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the Reporter's proprietorship.

2. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty

acres of Waste Land—The Gold Medal, or Ten Pounds. To be lodged by 1st November in any year.

3. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of Waste Land—The Gold Medal, or Ten Pounds. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Pounds. To be lodged by 1st November in any year.

The Reports in competition for Nos. 2, 3, and 4 may comprehend such general observations on the improvement of waste lands as the writer's experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of profitable character, and a rotation of crops must have been concluded before the date of the Report. *A detailed statement of the expenditure and return* and a certified measurement of the ground are requisite.

5. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the Pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten pounds. To be lodged by 1st November in any year.

6. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 5 and 6 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

SECTION 3.—HIGHLAND INDUSTRIES.

FOR APPROVED REPORTS.

1. The best mode of treating native Wool; cleaning, carding, dyeing, spinning, knitting, and weaving by hand in the Highlands and Islands of Scotland—Five Pounds. To be lodged by 1st November in any year.

SECTION 4.—MACHINERY.

FOR APPROVED REPORTS.

To be lodged by 1st November in any year.

SECTION 5.—FORESTRY.

FOR APPROVED REPORTS.

1. On Plantations of not less than eight years' standing formed on deep peat-bog—The Medium Gold Medal, or Five Pounds. To be lodged by 1st November in any year.

The Premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and number of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

GROUP II.—DISTRICT GRANTS.

APPLICATIONS.

Forms of Application may be obtained from the Secretary, 8 Eglinton Crescent, Edinburgh 12, which should be completed and returned on or before ***1st November 1938,*** in respect of a Grant commencing in the following year.

Renewal of Grant.—Applications for **renewal** of a particular Grant will be entertained only after the lapse of a specified interval of years (as undernoted) from the termination of the previous Grant, without prejudice, however, to the competency of applying in such intermediate years for a Grant in any other class.

Class.	Interval.
1. Grants of £12 for Show Premiums for Horses, Cattle, Sheep, and Pigs	4 years.
2. Grants of £15 in respect of Stallions engaged for Agricultural purposes	3 years.
3. Grants of Silver Medals in aid of Premiums	2 years.
4. Special Grants	—
5. Grants of £10 to Federations of S.W.R.I. for Show or Exhibition Prizes	2 years.

CLASS 1.

LOCAL AGRICULTURAL SOCIETIES—GRANTS OF £12 FOR SHOW PREMIUMS FOR HORSES, CATTLE, SHEEP, AND PIGS.

Regulations, 1937.

1. Class of Stock—Limit of Grants, £340.—The Highland and Agricultural Society will make Grants to Local Societies for prizes for *Breeding Animals* in any of the following Classes of Stock, viz. :—

Cattle.

Shorthorn.
Aberdeen-Angus.
Galloway.
Belted Galloway.
Highland.
Ayrshire.
British Friesian.
Red Poll.
Jersey.
Shetland.

Pigs.

Any Pure Breed.

Horses.

Draught Horses.
Hunters.
Hackneys.
Ponies.
Shetland Ponies.

Sheep.

Blackface.
Cheviot.
Border Leicester.
Half-Bred.
Shropshire.
Oxford Down.
Suffolk.
Wensleydale.

Cross-bred [1] animals are not eligible. The Prizes must be confined to *Breeding* Animals ; " bullocks," " geldings," " wethers," and " hog pigs " are excluded.

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[1] *Exceptions to this rule may, however, be authorised by the Board of Directors, on application. The Directors are prepared to consider applications from Local Societies which desire to use their Grants, or part thereof, as prizes for cross-bred calves and one-year-old cross-bred cattle.*

2. All Competitions must be at the instance of a Local Society. A Committee of Management shall be appointed, and either the Convener of the Committee or the Secretary of the Society **must be a Member of the Highland and Agricultural Society of Scotland.**

3. GRANT TO SOCIETY, £12.—The portion of the Grant to any one Local Society shall not exceed the sum of £12 in any one year.

4. ALLOCATION OF GRANT.—The Grant from the Highland and Agricultural Society shall not be applied as a Grant in aid of the Premiums offered by the Local Society, but must be offered in the form of separate Prizes for the Animals chosen; **and the offer of the Prizes must be announced in the Premium List and Catalogue of the Show as "presented by the Highland and Agricultural Society of Scotland."**

5. CONTINUANCE OF GRANT—THREE YEARS.—The Money Grant shall continue for three alternate years, provided always that the Local Society shall, in the two intermediate years, continue the competition by offering Premiums for the same class of Stock as that selected in each previous year to compete for the Highland and Agricultural Society's Prizes.

If no competition takes place for two consecutive years the Grant expires.

6. MEDALS IN INTERMEDIATE YEARS.—In the two intermediate years the Highland and Agricultural Society will place three Silver Medals at the disposal of each Local Society, for the same classes of Stock as those for which the Money Premiums are offered, provided that not less than three lots are exhibited in the same class.

7. When it is agreed to hold the General Show of the Society in any one of the Show Divisions, no Local Society may hold a Show within that Division in the **three months immediately preceding** the date of the General Show. **In the event of a Show being held, the entire Grant to the Local Society will be cancelled.**

8. RULES OF COMPETITION.—The Rules of Competition for the Premiums, the funds for which are derived from Grants of the Highland and Agricultural Society, shall be such as are generally enforced by the Local Society in the case of Premiums offered from its own funds.

9. AREA AND PARISHES—FIVE PARISHES.—When making application for Grants from the Highland and Agricultural Society, the Local Society must delineate the area and the number of parishes comprised in the district, and, *except in special cases*, no Local Society shall be entitled to a Grant whose Show is not open to at least *five* Parishes.

10. REPORTS.—Forms of Report will be furnished to the Secretaries of Local Societies. Detailed reports of the competitions for the Society's Premiums must be given and the completed Reports, duly signed and certified, must be lodged with the Secretary of the Highland and Agricultural Society as soon as possible after the Show, and in no case later than **1st November.** These Reports are subject to the approval of the Directors of the Highland and Agricultural Society, against whose decision there shall be no appeal. **The Grant will lapse if no Report is lodged by the due date.**

11. GRANTS—WHEN PAID.—The Grants made to Local Societies will be paid in December after the Reports of the awards of the prizes have been received and found to be in order and passed by

the Board of Directors, the Money Grants being paid to the Secretaries of the Local Societies and the Medals sent direct to the winners. *The Secretary of the Local Society must not on any condition whatever pay any Premium offered by the Highland and Agricultural Society until he has been informed that the awards are in order and has received the Grant from the Highland and Agricultural Society.*

12. RENEWAL OF GRANT. — No application for renewal of a Grant to a Local Society will be entertained until after the expiry of *four years* from the termination of the last Grant.

13. DISPOSAL OF APPLICATIONS.—In disposing of applications for District Grants, the Directors of the Highland and Agricultural Society shall keep in view the length of interval that has elapsed since the expiration of the last Grant, giving priority to those Local Societies which have been longest off the list.

Grants in 1938.

5th and Final Year—GRANT OF £12.

1. CENTRAL BANFFSHIRE FARMERS' CLUB.
   Convener—George A. Morrison, Botary Mains, Cairnie, Huntly.
   Secretary—John C. Gray, North of Scotland Bank Buildings, Moss Street, Keith.
   Granted 1933. (Grant in abeyance 1935, on account of Aberdeen Show.)

2. KIRKPATRICK-DURHAM HORTICULTURAL AND AGRICULTURAL SOCIETY.
   Convener—Lieut.-Colonel Pollock Morris, Chipperkyle, Kirkpatrick-Durham, Castle Douglas.
   Secretary—W. F. Allan Stewart, Durhamhill, Kirkpatrick-Durham, Castle Douglas.
   Granted 1933. (Grant in abeyance 1937—no Show held.)

3. NORTHERN COUNTIES AGRICULTURAL SOCIETY.
   Convener—J. H. Fraser, Easter Lovat, Beauly.
   Secretary—R. T. W. Wilson Anderson, Solicitor, Dingwall.
   Granted 1934.

4. STEWARTRY AGRICULTURAL SHOW.
   Promoted by the St Mary's Isle Agricultural Society, the Dalbeattie Agricultural Society, and the Gatehouse District Agricultural Society.
   Convener—Sir Andrew M'Culloch, Lochanhead, Dumfries.
   Secretary—T. Mackenzie, Estate Agent, Castle Douglas.
   Granted 1934.

5. DEESIDE AGRICULTURAL ASSOCIATION.
   Convener—William Hector, Upper Anguston, Peterculter.
   Secretary—David Humble, Dowalty, Crathes.
   Granted 1934.

6. Garioch Farmer Club.
   Convener—Major A. R. Leith of Petmathen, Oyne, Aberdeenshire.
   Secretary—Alexander Watt, Cairnhill, Rothney, Insch.
   Granted 1934.

7. Rossie Priory and District Agricultural Society.
   Convener—William Niven, The Loan Farm, Errol, Perthshire.
   Secretary—D. J. Rae, Linmor, Highfield Road, Scone, Perth.
   Granted 1934.

8. East of Fife Agricultural Society.
   Convener—A. O. Cheape, Yr. of Strathtyrum, St Andrews.
   Secretary—George M'Dougall, Commercial Bank of Scotland Ltd., Colinsburgh, Fife.
   Granted 1934.

9. North Uist Agricultural Society.
   Convener—Captain R. M'Erlich, Lochmaddy.
   Secretary—Peter Morrison, J.P., Sollas, Lochmaddy.
   Granted 1934.

4th (Intermediate) Year—3 SILVER MEDALS.

10. Tiree Agricultural Show Society.
    Convener—John M. Brown, Scarinish, Isle of Tiree.
    Secretary—Hugh MacKinnon, Crosspol, Isle of Tiree.
    Granted 1932. (Grants in abeyance 1932, 1935, and 1936—no Shows held.)

11. Inverurie Agricultural Association.
    Convener—William Valentine, Thainstone, Kintore.
    Secretary—William R. Cockburn, Holm Cottage, Inverurie.
    Granted 1935.

12. Strathdon Agricultural Association.
    Convener—David D. Laurie, Estates Office, Strathdon, Alford, Aberdeenshire.
    Secretary—William M'Robert, Culfork, Strathdon, Alford, Aberdeenshire.
    Granted 1935.

13. Ythanside Farmers' Club.
    Convener—James Taylor, Cairnfechel, Udny, Aberdeenshire.
    Joint-Secretaries—William Watson and James Mutch, 20 The Square, Ellon, Aberdeenshire.
    Granted 1935.

14. Carrick Farmers' Society.
    Convener—J. D. H. Forbes, Jameston, Maidens, Ayrshire.
    Secretary—James M. Gibson, Royal Bank of Scotland, Maybole.
    Granted 1935.

15. Arran Farmers' Society.
    Convener—James J. Morton, Machrie, Isle of Arran.
    Secretary—Donald M'Allister, Clachaig, Kilmorie, Isle of Arran.
    Granted 1935.

16. NORTH OF FIFE FOAL SHOW SOCIETY.
Convener—John Arbuckle, Lower Luthrie, Cupar, Fife.
Secretary—David Blair, Littleinch, Wormit, Fife.
Granted 1935.

17. FETTERCAIRN FARMERS' CLUB.
Convener—John Milne, Tillytoghills, Fettercairn.
Secretary—James Henry, Hatton Mains, Laurencekirk.
Granted 1935.

18. BOTHWELL FARMERS' SOCIETY.
Convener—James Russell, Townhead Farm, Holytown, Lanarkshire.
Secretary—William Stevenson, Royal Bank of Scotland, Bellshill, Lanarkshire.
Granted 1935.

19. BARRHEAD AGRICULTURAL SOCIETY.
Convener—William W. Rennie, Glenview, Potterhill Avenue, Paisley.
Secretary—James B. Sloss, The National Bank of Scotland Ltd., Barrhead.
Granted 1935.

20. WEST TEVIOTDALE AGRICULTURAL SOCIETY.
Convener—Douglas Oliver, Hassendeanbank, Hawick.
Secretary—James W. P. Amos, Royal Bank Buildings, Hawick.
Granted 1935.

3rd (Alternate) Year—GRANT OF £12.

21. EASTERN DISTRICT OF STIRLINGSHIRE AGRICULTURAL ASSOCIATION.
Convener—George Steel, Mungal, Falkirk.
Secretary—Robert Waugh, Auction Mart, Falkirk.
Granted 1935. (Grant in abeyance 1937, on account of Alloa Show.)

22. ISLAY, JURA, AND COLONSAY AGRICULTURAL ASSOCIATION.
Convener—William Walker of Foreland, Isle of Islay.
Secretary—Iain M. Mactaggart, Royal Bank of Scotland, Bowmore, Isle of Islay.
Granted 1936.

23. MARNOCH AND CORNHILL AGRICULTURAL SOCIETY.
Convener—William Innes, Redstack, Portsoy, Banffshire.
Secretary—William Gray, Mill of Park, Cornhill, Banffshire.
Granted 1936.

24. BUTE AGRICULTURAL SOCIETY.
Convener—John Dickie, Cranslagvourity, Isle of Bute.
Secretary—James M. Matheson, County Buildings, Rothesay.
Granted 1936.

25. GLENKENS AGRICULTURAL SOCIETY.
Convener—Hon. H. M. Upton, Balmaclellan, Castle Douglas, Kirkcudbrightshire.
Secretary—J. M. Garmory, Pomona Terrace, New Galloway, Kirkcudbrightshire.
Granted 1936.

26. DALSERF FARMERS' SOCIETY.
Convener—John Fleming, Marrshill, Draffan, Kirkmuirhill, Lanarkshire.
Secretary—Robert Milligan, Summerhill Avenue, Larkhall, Lanarkshire.
Granted 1936.

27. YARROW AND ETTRICK PASTORAL SOCIETY.
Convener—John Steele, Carterhaugh, Selkirk.
Secretary—George Brunton, Harehead, Selkirk.
Granted 1936.

2nd (Intermediate) Year—3 SILVER MEDALS.

28. STRATHENDRICK AGRICULTURAL SOCIETY.
Convener—H. Wylie Rennie, Craighat, Killearn.
Secretary—Robert Bilsland, 35 Wylie Avenue, Alexandria, Dumbartonshire.
Granted 1936. (Grant in abeyance 1937.)

29. ABERDOUR AND NORTH-EASTERN AGRICULTURAL ASSOCIATION.
Convener—William Simmers, Overton, Memsil, Fraserburgh.
Secretary—G. W. Chalmers, Castle Farm, Rosehearty, Fraserburgh.
Granted 1937.

30. ECHT, SKENE, AND MIDMAR AGRICULTURAL ASSOCIATION.
Convener—David Morris, Factor, Dunecht Estates Limited, Dunecht, Aberdeenshire.
Secretary—A. F. Robertson, Bank House, Echt, Aberdeenshire.
Granted 1937.

31. KILMACOLM AND PORT-GLASGOW AGRICULTURAL SOCIETY.
Convener—Sir Alexander T. Taylor, K.B.E., The Grange, Kilmacolm.
Secretary—Thomas Russell, Royal Bank of Scotland, Kilmacolm.
Granted 1937.

32. BLACK ISLE FARMERS' SOCIETY.
Convener—J. M'Donald, Newton Farm, Avoch.
Secretary—Francis Scott, Rosenberg, Cromarty.
Granted 1937.

33. KILLEARN AGRICULTURAL SOCIETY.
Convener—John M'Queen, Laigh Finnich, Dumgoyne Station.
Secretary—A. D. S. Macadam, Drumtian, Balfron Station.
Granted 1937.

1st Year—GRANT of £12.

34. FORMARTINE AGRICULTURAL ASSOCIATION.
Convener—William Tough, Pitmedden, Udny, Aberdeenshire.
Secretaries—David S. Minto and Alfred Marr, Ardmore, Udny, Aberdeenshire.
Granted 1938.

35. STRATHBOGIE FARMER CLUB.
Convener—George W. Mitchell, Kirktownmills, Drumblade, Huntly.
Secretary—John Stuart, Commercial Bank Buildings, Huntly.
Granted 1938.

36. ISLAY AGRICULTURAL ASSOCIATION.
Convener—John G. Morrison of Islay, Islay House, Bridgend, Isle of Islay.
Secretary—William D. Campbell, National Bank of Scotland Ltd., Bridgend, Isle of Islay.
Granted 1938.

37. CUMBERNAULD AGRICULTURAL SOCIETY.
Convener—Samuel Young, Balloch Farm, Croy Station.
Secretary—John Longwill, District Council Office, Cumbernauld.
Granted 1938.

38. SKYE AGRICULTURAL SOCIETY.
Convener—A. MacCallum, D.O.A.S., Estates Office, Portree, Isle of Skye.
Secretary—J. W. Dougal, D.O.A.S., Estates Office, Portree, Isle of Skye.
Granted 1938.

39. STONEHOUSE AGRICULTURAL SOCIETY.
Convener—William Wilson, Udston Farm, Stonehouse, Lanarkshire.
Secretary—James E. Cowper, Post Office, Stonehouse, Lanarkshire.
Granted 1938.

40. STRATHSPEY FARMERS' CLUB.
Convener—James Grant, Rothiemoon, Nethy Bridge, Inverness-shire.
Secretary—Major John G. MacDougall, O.B.E., Dunollie, Grantown-on-Spey.
Granted 1938.

41. LOWER WARD OF RENFREWSHIRE AGRICULTURAL SOCIETY.
Convener—Colonel Guy Shaw-Stewart, Ardgowan, Inverkip, Renfrewshire.
Secretary—Andrew F. Macmillan, Commercial Bank of Scotland Ltd., 22 West Blackhall Street, Greenock.
Granted 1938.

42. Selkirk and Galashiels Agricultural Society.
Convener—William Pate, Fairnilee, Galashiels.
Secretary—John Hendrie, The Yair, Galashiels.
Granted 1938.

43. Denny and Dunipace Agricultural Association.
Convener—Henry C. Bennie, Greensburn, Denny.
Secretary—John M'Millan, 37 Stirling Street, Denny.
Granted 1938.

44. Bathgate Agricultural Association.
Convener—William Livingston, "Arbeg," Balbardie Road, Bathgate.
Secretary—John Alston, 13 Mid Street, Bathgate.
Granted 1938.

CLASS 2.

HORSE ASSOCIATIONS—GRANTS OF £15 IN RESPECT OF STALLIONS ENGAGED FOR AGRICULTURAL PURPOSES.

Old Regulations (applicable to Nos. 1 to 17 for the year 1938).

1. The Highland and Agricultural Society will make Grants to Horse Associations and other Societies in different districts engaging Stallions for agricultural purposes. The total sum expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £210 in any one year.

2. The portion of the Grant to any one Association or Society shall not exceed the sum of £15 in any one year. It is intended that the Grant shall be used by the Association or Society for the purpose of enabling it to secure a better class of Stallion.

3. The Grants will be available only for Stallions which, for the years to which the Grants apply, are registered in the Register of Certified Draught Stallions published by the Department of Agriculture for Scotland. (For information regarding the Registration of Stallions, apply to the Secretary of the Department of Agriculture for Scotland, 29 St Andrew Square, Edinburgh.)

4. The Grant will continue for three years provided the Association receiving the Grant shall hire a Registered Stallion in the two intermediate years.

5. In the event of a Horse not being engaged in any one year while the provisions of the Grant are in force, the Grant made by the Highland and Agricultural Society will cease.

6. Regulations 2 (Committee and Convener), 10 (Reports), 11 (Time of Payment), 12 (Renewal of Grant), and 13 (Disposal of Applications) applicable to Class 1, shall be applicable to this Class.

Grants in 1938.

5th and Final Year—GRANT OF £15.

1. VALE OF ALFORD AND ABERDEEN DISTRICT HORSE-BREEDING SOCIETY.
   Convener—John Milne, Kingsford House, Alford, Aberdeenshire.
   Secretary—James Lawson, Baldyvin, Alford, Aberdeenshire.
   Granted 1934.

2. CAITHNESS HORSE-BREEDING ASSOCIATION.
   Convener—John A. Mowat, Lybster, Caithness.
   Secretary—A. G. Doull, Lybster, Caithness.
   Granted 1934.

4th (Intermediate) Year—Grant in Abeyance.

3. CARSE AND DUNDEE DISTRICT STALLION SOCIETY.
   Convener—William L. Thoms, Benvie, Invergowrie.
   Secretary—Joseph Murray, Balruddery Farm, Invergowrie.
   Granted 1935.

4. STRATHAVEN AND GLENLIVET HORSE-BREEDING ASSOCIATION.
   Convener—Alexander Riach, Findron, Tomintoul.
   Secretary—Charles Lindsay, J.P., Croughly, Tomintoul.
   Granted 1935.

5. WALLS AND HOY AGRICULTURAL SOCIETY.
   Convener—James Baillie, Farm of Snelsetter, Longhope, Walls, Orkney.
   Secretary—William Sutherland, The Old Custom House, Longhope, Walls, Orkney.
   Granted 1935.

6. BLACK ISLE HORSE-BREEDING SOCIETY.
   Convener—Donald Gray, Balrailan Mains, Duncanston, Conon Bridge.
   Secretary—James MacDonald, Brae Park, Duncanston, Conon Bridge.
   Granted 1935.

3rd (Alternate) Year—GRANT OF £15.

7. ELLON AND DISTRICT HORSE-BREEDING SOCIETY.
   Convener—R. P. Ligertwood, J.P., Piltochie, Ellon, Aberdeenshire.
   Secretary—James A. Ligertwood, Piltochie, Ellon, Aberdeenshire.
   Granted 1936.

8. CENTRAL FORFARSHIRE HORSE-BREEDING ASSOCIATION.
   Convener—James Scott, Bonnyton, Inverarity, Angus.
   Secretary—Walter R. Findlay, Mains of Balmadies, Guthrie.
   Granted 1936.

9. ROTHIEMAY HORSE-BREEDING SOCIETY.
Convener—James Wilson, Home Farm, Auchintoul, Marnoch.
Secretary—Alexander J. Walker, Woodside, Rothiemay, Huntly.
Granted 1936.

10. WESTRAY HORSE-BREEDING SOCIETY.
Convener—William F. Brown, Breckowall, Westray, Orkney.
Secretary—Benjamin Bremner, Hilldevale, Westray, Orkney.
Granted 1936.

11. BUCHLYVIE AND VALE OF MENTEITH HORSE-BREEDING AND STOCK IMPROVEMENT SOCIETY, LTD.
Convener—John M'Queen, Laigh Finnich, Dumgoyne Station.
Secretary—Miss M. M. Drysdale, 55 Colinton Road, Edinburgh.
Granted 1936.

2nd (Intermediate) Year—Grant in Abeyance.

12. STRATHBOGIE FARMER CLUB.
Convener—George W. Mitchell, Kirktownmills, Drumblade, Huntly.
Secretary—John Stuart, Commercial Bank Buildings, Huntly.
Granted 1937.

13. LORN ENTIRE HORSE SOCIETY.
Convener—Donald MacGillivray, Barcaldine Home Farm, Connel, Argyll.
Secretary—Duncan Mackay, National Bank of Scotland Ltd., Oban.
Granted 1937.

14. CAITHNESS CLYDESDALE CLUB.
Convener—John Swanson, Banks Lodge, Watten, Caithness.
Secretary—John Gowans, Janetstown, Wick, Caithness.
Granted 1937.

15. LANARK HORSE-BREEDING SOCIETY.
Convener—Robert Paterson, Greenshields, Carnwath.
Secretary—Alexander Clarkson, Pretts Mill, Lanark.
Granted 1937.

16. ORKNEY WEST MAINLAND HORSE-BREEDING SOCIETY.
Convener—Charles Hourston, Beaquoy Farm, Dounby, Kirkwall.
Secretary—John G. S. Flett, Nistaben Farm, Harray, Kirkwall.
Granted 1937.

NEW REGULATIONS, 1938 (applicable to Nos. 18 to 23).

1. The Highland and Agricultural Society will make Grants to Horse Associations and other Societies in different districts engaging Stallions for agricultural purposes. The total sum expended by the

Highland and Agricultural Society in such grants shall not exceed the sum of £210 in any one year.

2. *Application of Grant.*—The portion of the Grant to any one Association or Society shall not exceed the sum of £15 in any one year. **It is intended that the Grant shall be used by the Association or Society for the purpose of enabling it to secure a better class of Stallion.**

3. *Duration of Grant.*—The Grant will continue for three consecutive years.

4. *Registration of Stallions.*—The Grants will be available only for Stallions which, for the years to which the Grants apply, are registered in the Register of Certified Draught Stallions published by the Department of Agriculture for Scotland. (For information regarding the Registration of Stallions, apply to the Secretary of the Department of Agriculture for Scotland, 29 St Andrew Square, Edinburgh.)

5. *Engagement of Stallions.*—In the event of a Horse not being engaged in any one year while the provisions of the Grant are in force, the Grant made by the Highland and Agricultural Society will cease.

6. *Renewal of Grant.*—An Association or Society which has received a Grant shall not be eligible to apply for a renewal of the Grant until after the expiry of three years from the termination of the previous Grant.

7. REGULATIONS 2 (Committee and Convener), 10 (Reports), 11 (Time of Payment), and 13 (Disposal of Applications) applicable to Class 1, shall be applicable to this Class.

2nd Year—GRANT OF £15.

17. ROSS OF MULL HEAVY HORSE-BREEDING SOCIETY.
Convener—P. A. MacKeand, Scoor, Bunessan, Isle of Mull.
Secretary—W. R. MacDougall, Uisgean, Bunessan, Isle of Mull.
Granted 1937.

1st Year—GRANT OF £15.

18. SOUTH DEESIDE STOCK IMPROVEMENT SOCIETY.
Convener—John Pirie, Maryfield, Banchory-Ternan.
Secretary—John Duncan, Craiglug, Durris.
Granted 1938.

19. NAIRNSHIRE FARMING SOCIETY.
Convener—Joseph Mackay, Glebe End, Nairn.
Secretary—Archibald J. Mackintosh, St Colms, Auldearn, Nairn.
Granted 1938.

20. EAST MAINLAND CO-OPERATIVE HORSE-BREEDING SOCIETY LTD.
Convener—Robert C. Twatt, Upper Scapa, St Ola, Orkney.
Secretary—David J. Laughton, Millbrae, Tankerness, Kirkwall.
Granted 1938.

21. SCOTTISH CENTRAL HORSE-BREEDING ASSOCIATION.
Convener—John Stirling, Parkhead, Alloa.
Secretary—Miss Agnes M'Lay, Dunvegan, Causewayhead, Stirling.
Granted 1938.

22. SELKIRK AND GALASHIELS AGRICULTURAL SOCIETY.
Convener—William Pate, Fairnilee, Galashiels.
Secretary—John Hendrie, The Yair, Galashiels.
Granted 1938.

23. MACHARS HORSE-BREEDING ASSOCIATION.
Convener—John Gordon, Blairshinnoch, Port William, Wigtownshire.
Secretary—William Dickson, Marine Terrace, Port William, Wigtownshire.
Granted 1938.

CLASS 3.

LOCAL AGRICULTURAL SOCIETIES—GRANTS OF SILVER MEDALS IN AID OF PREMIUMS.

REGULATIONS 1938.

The Society, being anxious to co-operate with local Societies, will give a limited number of Silver Medals annually to Societies (but not concurrently if also in receipt of a Grant under Class 1), in addition to the Money Premiums offered by them, for—

1. Best Bull, Cow, or Heifer of any pure breed specified in Class 1.
2. Best Stallion or Mare of any pure breed specified in Class 1.
3. Best Tup or Pen of Ewes of any pure breed specified in Class 1.
4. Best Boar, Sow, or Breeding Pig of any pure breed.
5. Best Pens of Poultry.
6. Best Sample of any variety of Wool.
7. Best Sample of any variety of Seeds.
8. Best-managed Farm.
9. Best-managed Green Crop.
10. Best-managed Hay Crop.
11. Best-managed Dairy.
12. Best Sweet-Milk Cheese.
13. Best Cured Butter.
14. Best Fresh Butter.
15. Best collection of Roots.
16. Best-kept Fences.
17. Best Sheep-Shearer.
18. Most expert Hedge-Cutter.
19. Most expert Labourer at Draining.
20. Best Maker of Oatcakes.

It is left to the local Society to choose out of the foregoing list the classes to which the Medals are to be allocated.

RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.

2. The classes for which Medals are granted must be in accordance with the foregoing list. The Local Committee shall select the classes, and specify them in the Report.

3. The offer of the Medals must be announced in the Premium List and Catalogue of the Show as "presented by the Highland and Agricultural Society of Scotland."

4. The Medals are granted for two years, and lapse if not awarded in those years.

5. No Society shall receive more than two Medals in any year.

6. A Committee of Management shall be appointed, and either the Convenor of the Committee or the Secretary of the Society **must be a member of the Highland and Agricultural Society of Scotland.**

7. When it is agreed to hold the General Show of the Society in any one of the Show Divisions, no Local Society may hold a Show within that Division in the **three months** immediately **preceding** the date of the General Show. **In the event of a Show being held, the entire Grant will be cancelled.**

8. The Money Premiums given in the District must be not less than £2 for each Medal offered.

9. The Medal for Sheep-Shearing shall always accompany the highest Money Premium.

10. There must not be fewer than three competitors in all the classes.

11. Regarding Reports and despatch of Medals, Rules 10 and 11, Class 1, will apply.

12. When a grant of Medals has expired, the Society cannot apply again for Medals for two years.

Grants in 1938.

2nd Year.

1. CARNWATH AGRICULTURAL SOCIETY.
   Convener—Andrew S. Lawson, Guildhouse, Forth, Lanarkshire.
   Secretary—A. M. White, Commercial Bank of Scotland Ltd., Carnwath.
   Granted 1936. (2 Medals—Stock.) (Grant in abeyance 1936.)

2. UPPER DONSIDE AGRICULTURAL ASSOCIATION.
   Convener—James M'Hardy, Home Farm, Clova, Aberdeenshire.
   Secretary—Alexander Kellas, Hillockhead, Cushnie, Alford, Aberdeenshire.
   Granted 1937. (2 Medals—Stock.)

1st Year.

3. FYVIE HORTICULTURAL AND INDUSTRIAL ASSOCIATION.
   Convener—George Morrison, Percy Villa, Fyvie, Aberdeenshire.
   Secretary—Leonard Milne, Station Cottage, Fyvie, Aberdeenshire.
   Granted 1938. (2 Medals—Dairy Produce.)

4. ROTHIENORMAN AUTUMN EXHIBITION SOCIETY.
   Convener—John W. Cruickshank, Logie Newton, Rothienorman, Aberdeenshire.
   Secretary—James Simpson, Brownhill, Rothienorman, Aberdeenshire.
   Granted 1938. (2 Medals—Roots and Oatcakes.)

5. MAUCHLINE HORTICULTURAL AND AGRICULTURAL SOCIETY.
Convener—James Campbell, Kenmore, Mauchline, Ayrshire.
Secretary—R. C. Baird, B.Sc., Ashgrove, Mauchline, Ayrshire.
Granted 1938. (2 Medals—Roots and Produce.)

6. SOUTH UIST AND BENBECULA CATTLE SHOW SOCIETY.
Convener—Dr James Paterson, Sorelle Lodge, Benbecula, Isle of South Uist.
Secretary—John J. Wilson, 15 Griminish, Benbecula, Isle of South Uist.
Granted 1938. (2 Medals—Dairy Produce.)

7. SOUTH RONALDSHAY AND BURRAY AGRICULTURAL SOCIETY.
Convener—David Scott, Grutha, St Margaret's Hope, Orkney.
Secretary—Miss Isabella G. L. Esson, St Margaret's Hope, Orkney.
Granted 1938. (2 Medals—Dairy Produce.)

8. EAST MAINLAND HORTICULTURAL SOCIETY, ORKNEY.
Convener—Charles Calder, Sebay, Tankerness, Orkney.
Secretary—Miss Winnie M. Flett, Millbrae, Tankerness, Orkney.
Granted 1938. (1 Medal—Oatcakes.)

9. ARDOCH AGRICULTURAL SOCIETY.
Convener—John Chalmers, Home Farm, Braco Castle, Braco, Perthshire.
Secretary—Anthony Stalker, Jun., Broomhill, Braco, Perthshire.
Granted 1938. (2 Medals—Stock.)

CLASS 4.

SPECIAL GRANTS—1938.

(1) ANNUAL.

1. AYRSHIRE AGRICULTURAL ASSOCIATION, £20, to be competed for at the Dairy Produce Show at Kilmarnock.
Convener of Dairy Show Committee—William M'Fadzean, 35 Dundonald Road, Kilmarnock.
Secretary—James A. Paterson, Showground, Content Avenue, Ayr.
Granted 1872.

2. BRITISH DAIRYMAIDS' ASSOCIATION.
Hon. President—Mrs William Meiklem, Bennochy Park, Kirkcaldy.
President—Mrs John W. Prentice, Craigrie Farm, Clackmannan.
Hon. Secretary—Mrs D. G. More, 92 Montpelier Park, Edinburgh 10.
1 Minor Gold Medal and 1 Medium Silver Medal for Champion Buttermaking Competitions at the Scottish National Fat Stock Club Show, Edinburgh.
Granted 1908.

3. NORTHERN COUNTIES ARTS AND CRAFTS SOCIETY, £20.
Convener—Miss Mackintosh of Raigmore, Raigmore, Inverness.
Joint-Secretaries—Mrs Mitford, Berryfield, Lentran, and Miss Ruth Mackintosh, Raigmore, Inverness.
Granted 1922.

4. NORTH OF SCOTLAND COLLEGE OF AGRICULTURE.
Secretary—R. M. Lemmon, B.L., Crown Mansions, 41½ Union Street, Aberdeen.
3 Silver Medals (1 Large, 1 Medium and 1 Minor)—1st, 2nd, and 3rd Prizes respectively—for *Sir John Fleming Cup* Stackyard Competition.
Granted 1925.

5. SCOTTISH NATIONAL UNION OF ALLOTMENT HOLDERS.
Secretary and Treasurer—Archibald W. Fisher, Solicitor, 18 Hill Street, Edinburgh.
£15 and 15 Medium Silver Medals for best Allotments.
Granted 1927.

6. GALLOWAY DAIRY PRODUCE SHOW SOCIETY, £12, to be competed for at the Dairy Produce Show at Castle Douglas.
President—Walter C. Crawford, Chapmanton, Castle Douglas.
Secretary—Patrick Gifford, Royal Bank Offices, Castle Douglas.
Granted 1936.

7. SHETLAND FLOCK BOOK SOCIETY, £10, 10s., to be offered at Tingwall Show as prizes for Shetland Sheep, judged according to the standard of the Flock Book Society.
Secretary—H. T. Sutherland, Brentham Place, Lerwick.
Granted 1938. (For the years 1938-1942 inclusive.)

(2) IN ALTERNATE YEARS.—GRANTS IN 1938.

8. ROUSAY AGRICULTURAL SOCIETY, ORKNEY, £3.
Convener—R. S. Mainland, Nearhouse, Rousay, Orkney.
Secretary—John Linklater, Blossom, Sourin, Rousay, Orkney.
Granted 1903.

9. SOUTH RONALDSHAY AND BURRAY AGRICULTURAL SOCIETY, ORKNEY, £3.
Convener—David Scott, Grutha, St Margaret's Hope, Orkney.
Secretary—Miss Isabella G. L. Esson, St Margaret's Hope, Orkney.
Granted 1904.

10. SHAPANSEY AGRICULTURAL ASSOCIATION, ORKNEY, £3.
Convener—William T. Wood, Balfour Mains, Shapansey, Orkney.
Secretary—D. L. Kemp, Bayview, Shapansey, Orkney.
Granted 1934.

(3) In Alternate Years.—Grants in Abeyance, 1938.

11. Orkney Agricultural Society, £3.
Convener—Alexander S. Johnston, Ingashowe, Firth, Orkney.
Joint-Secretaries—D. Flett and J. C. Croy, Junction Road, Kirkwall.
Granted 1883.

12. East Mainland Agricultural Society, Orkney, £3.
Convener—William G. Smith, Hall of Tankerness, Tankerness, Orkney.
Secretary—Alfred C. Tait, Quoyburray, Tankerness, Orkney.
Granted 1898.

13. West Mainland Agricultural Society, Orkney, £3.
Convener—William G. Rendall, Skaill, Rendall, Orkney.
Secretary—James Wood, Garson, Sandwick, Orkney.
Granted 1900.

14. Sanday Agricultural Association, Orkney, £3.
Convener—W. Cowper Ward, Scar House, Sanday, Orkney.
Secretary—John Wallace, Prattsfauld, Sanday, Orkney.
Granted 1902.

15. Yell Agricultural Society, Shetland, £3.
Convener — T. R. Manson, Ladybank, West Sandwick, Lerwick.
Secretary—Robert Johnson, The Manse, West Sandwick, Lerwick.
Granted 1931.

CLASS 5.

FEDERATIONS OF SCOTTISH WOMEN'S RURAL INSTITUTES—GRANTS OF £10.

Regulations, 1938.

1. The Highland and Agricultural Society of Scotland will provide annually a sum not exceeding £150 as special Grants to Federations of Scottish Women's Rural Institutes.

2. *Grant to Federation*, £10.—The amount of the Grant to any one Federation shall not exceed the sum of £10 per annum.

3. *Duration of Grant.*—The Grant will continue for two consecutive years.

4. *Disposal of Applications.*—In disposing of applications for Grants, the Directors of the Highland and Agricultural Society shall keep in view the length of interval that has elapsed since the expiration of the last Grant, giving priority to those Federations which have been longest off the list.

5. *Eligibility to Apply.*—All applications must be at the instance of a properly constituted Federation of Institutes.

6. *Application of Grant.*—The Grant of £10 shall not be applied as a Grant-in-aid to the general funds of a Federation, but must be offered in the form of Prizes at any Show or Competition held under the auspices of the Federation.

7. *Announcement of Grant.*—The offer of Prizes must be announced in the Prize List or Catalogue of the Show or Competition as "presented by the Highland and Agricultural Society of Scotland," or the amount of the Grant must be shown as a separate item of donation in the published statement of Accounts.

8. *Rules of Competition.*—The Rules of Competition for the Prizes, the funds for which are derived from Grants of the Highland and Agricultural Society of Scotland, shall be such as are generally enforced in the case of Prizes offered from the Federation's own funds.

9. *Report to be Submitted.*—Forms of Report will be furnished to the Secretaries of Federations, and these must be completed and returned to the Society as soon as possible after the Show or Competition and in no case later than **1st November.** These Reports are subject to the approval of the Directors of the Highland and Agricultural Society, against whose decision there shall be no appeal. All Reports must be signed and certified as marked on the Form.

The Grant will lapse if no Report is lodged.

10. *Payment of Grant.*—Payment of the Grant will be made in December after the Reports of the Awards have been received and found to be in order and passed by the Board of Directors.

11. *Renewal of Grant.*—A Federation which has received a Grant for two consecutive years shall not be eligible to apply for a renewal of the Grant until after the expiry of two years from the termination of the previous Grant.

Grants in 1938.

2nd Year.

1. ARRAN, ISLE OF, FEDERATION.
Convener—Mrs Currie, Alma Terrace, Brodick, Isle of Arran.
Secretary—Mrs Dodds, The Schoolhouse, Brodick, Isle of Arran. Granted 1937.

2. CAITHNESS FEDERATION.
Convener—Mrs Gore-Browne Henderson of Bilbster, Wick, Caithness.
Show Secretary—Miss A. S. M'I. Bain, Bowermadden, Bower, Wick, Caithness.
Granted 1937.

3. FIFE FEDERATION.
Convener—Mrs Gaskell, Largo Cottage, Upper Largo.
Secretary—Mrs Swanston, Carnbee Schoolhouse, Pittenweem.
Granted 1936. (Grant in abeyance 1937—postponed.)

4. MORAY AND NAIRN FEDERATION.
Convener—The Hon. Mrs Campbell, Auchindoune, Cawdor, Nairnshire.
Secretary—Miss Isabel Brown, Dipple, Fochabers, Moray.
Granted 1937.

5. ORKNEY FEDERATION.
Convener—Mrs Work, Craigiefield House, St Ola, Kirkwall.
Secretary—Miss C. Scarth, Twatt, Kirkwall.
Granted 1937.

6. PERTHSHIRE AND KINROSS-SHIRE FEDERATION.
Convener—Mrs Gardner, Barony Manse, Auchterarder.
Secretary—Mrs Methven, St Martin's Abbey, Perth.
Granted 1937.

7. STIRLING AND WEST PERTH FEDERATION.
Convener—Mrs M'Arthur, Rhuallan, Buchlyvie.
Secretary—Miss E. Baird, Sunnybrae, Avonbridge, Stirlingshire.
Granted 1937.

8. SUTHERLAND FEDERATION.
Convener—Mrs Whittett, Clashmore, Dornoch.
Secretary—Mrs Thompson, Stafford House, Brora.
Granted 1937.

1st Year.

9. DUNBARTONSHIRE FEDERATION.
Convener—Miss Eunice Murray, Moore Park, Cardross, Dumbartonshire.
Secretary—Mrs Dunlop, Albyn, Cardross, Dumbartonshire.
Granted 1938.

10. EAST LOTHIAN FEDERATION.
Convener—Mrs Hay, Belton, Dunbar.
Secretary—Mrs M'Kemmie, 2 Wemyss Place, Haddington.
Granted 1938.

11. FORFARSHIRE FEDERATION.
Convener—Mrs Babington, The Manse, Glamis.
Secretary—Miss M. C. M'Farlane, Mains of Careston, Brechin.
Granted 1938.

12. INVERNESS-SHIRE FEDERATION.
Convener—Mrs Ryan, Blar-a-cha, Roy Bridge, Inverness-shire.
Secretary—Miss Shaw, Caberfeidh, Fort William, Inverness-shire.
Granted 1938.

13. PEEBLESSHIRE FEDERATION.
Convener—Mrs Thomson, Kaimes, West Linton, Peeblesshire.
Secretary—Miss Thorburn, Craigerne, Peebles.
Granted 1938.

14. ROXBURGHSHIRE FEDERATION.
Convener—Mrs Cowan, The Roan, Lauder, Berwickshire.
Secretary—Miss H. E. Masson, Cavers, Hawick.
Granted 1938.

15. SELKIRKSHIRE FEDERATION.
Convener—Mrs Meade, The Hangingshaw, Selkirk.
Secretary—Mrs Macgown, Fairholm, Ettrickbridge, Selkirkshire.
Granted 1938.

GROUP III.—COTTAGES AND GARDENS, &c.

The following Premiums are offered for Competition.
The Premiums are granted for two years.

CLASS 6.

LOCAL SOCIETIES, &c.—GRANTS FOR BEST-KEPT COTTAGES AND GARDENS.

1.	Best-kept Cottage	£1	0	0
	Second best	0	10	0
2.	Best-kept Cottage Garden	1	0	0
	Second best	0	10	0

Forms of application may be obtained from the Secretary, and should be completed and returned on or before 1st November next, in respect of a Grant commencing in the following year.

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Lodges at Gentlemen's Approach Gates and Gardeners' Houses are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It shall be left to the Committee in the District to fix two grades of Cottages, with maximum rents of £10 and £16 respectively, and to apply for Grants of £3 in respect of each.

4. To warrant the award of full Premiums, there must not be fewer than three Competitors in each class. If there are less than three competitors in each class, only half Premium will be awarded.

5. A person who has gained the highest Premium cannot compete again.

6. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly; the windows must be free of broken glass, clean, and affording the means of ventilation. Dunghills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

7. In estimating the claims for the Garden Premiums, the judges should have in view—the sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

8. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be lodged with the Secretary of the Highland and Agricultural Society *on or before 1st November next.*

9. When a grant of Money has expired, the District cannot apply again for aid for four years.

Grants in 1938.

2nd Year.

1. COLINSBURGH AND KILCONQUHAR HORTICULTURAL ASSOCIATION.
Convener—Gilbert R. M'Carva, Balniel, Colinsburgh, Fife.
Secretary—William Adams, Balcarres Gardens, Colinsburgh, Fife.

Granted 1937.

1st Year.

Nil.

CLASS 7.

LOCAL SOCIETIES, &c.—GRANTS OF MINOR SILVER MEDALS FOR BEST-KEPT COTTAGES AND GARDENS, GARDEN PRODUCE, POULTRY, AND HONEY.

RULES OF COMPETITION.

1. The Society will give annually one or two Minor Silver Medals to a limited number of local Associations or individuals, who establish Competitions and Premiums for Cottages, Gardens, Garden Produce, or Bee-Keeping. The Medals will be granted for two years.

2. The Medals may be offered in any two of the following sections, *but under no circumstances will the two Medals be given in one of the sections :—*

(1) Best-kept Cottage or best-kept Cottage and Garden. (One Medal only.)
(2) Best-kept Garden. (One Medal only.)
(3) Best Collection of Garden Produce—Flowers excluded. (One Medal only.)
(4) Best Pen of Poultry. (One Medal only.)
(5) Honey. (One Medal only.)

3. The annual value of each cottage, with the ground occupied in the parish by a Competitor, must not exceed £20. The occupiers of Lodges at Gentlemen's Approach Gates, and Gardeners in the employment of others, are not entitled to compete.

4. If Competition takes place for Garden Produce, such produce must be *bona fide* grown in the Exhibitor's Garden. He will not be allowed to make up a collection from any other Garden. The produce must consist of Vegetables, or Vegetables and Fruit (not Fruit alone). Flowers are excluded.

5. The Honey must be the produce of the Exhibitor's own Hives.

6. To warrant the award of a Medal, there must not be fewer than three Competitors.

7. Forms of Report of Competitions will be furnished to the Secretaries in the different Districts. These must, in all details, be completed and lodged with the Secretary of the Highland and Agricultural Society as soon as possible after the Competition, and in no case later than 1*st November*, for the approval of the Directors, against whose decisions there shall be no appeal.

8. If no Competition takes place in a District for two years the grant expires.

9. When a grant of Medals has expired, the District cannot apply again for aid for two years.

Grants in 1938.

2nd Year.

1. NORTH UIST AGRICULTURAL SOCIETY.
Convener—Captain R. M'Erlich, Lochmaddy.
Secretary—Peter Morrison, J.P., Sollas, Lochmaddy.
Granted 1937. (2 Medals.)

2. GLASGOW DISTRICT BEEKEEPERS' ASSOCIATION.
Secretary—Mrs Shepherd, Greenfield, Newton Mearns.
Granted 1937. (1 Medal.)

1st Year.

3. FYVIE HORTICULTURAL AND INDUSTRIAL ASSOCIATION.
Convener—George Morrison, Percy Villa, Fyvie, Aberdeenshire.
Secretary—Leonard Milne, Station Cottage, Fyvie, Aberdeenshire.
Granted 1938. (1 Medal.)

4. ROTHIENORMAN AUTUMN EXHIBITION SOCIETY.
Convener—John W. Cruickshank, Logie Newton, Rothienorman, Aberdeenshire.
Secretary—James Simpson, Brownhill, Rothienorman, Aberdeenshire.
Granted 1938. (1 Medal.)

5. EAST MAINLAND HORTICULTURAL SOCIETY, ORKNEY.
Convener—Charles Calder, Sebay, Tankerness, Orkney.
Secretary—Miss Winnie M. Flett, Millbrae, Tankerness, Orkney.
Granted 1938. (1 Medal.)

GROUP IV.—PLOUGHING, HOEING, AND LONG FARM SERVICE.

1. MEDALS FOR PLOUGHING COMPETITIONS.

The Ploughing Medal will be given to the winner of the first Premium at Ploughing Competitions, provided a Report in the following terms on the official form is made to the Secretary, within one month of the Competition, by a Member of the Society. Forms of Report to be had on application.

FORM OF REPORT.

I, of , Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the Association at in the county of on the when ploughs competed ; of land were assigned to each, and hours were allowed for the execution of the work. The sum of £ was awarded as follows :—

[*Here enumerate the names and designations of successful Competitors.*]

RULES OF COMPETITION.

1. All Matches must be at the instance of a Local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.
2. The title of such Society or Association, together with the name and address of its Secretary, must be registered with the Secretary of the Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh.
3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.
4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.
5. A Member can report only one Match; and a Ploughman cannot carry more than three Medals in the same season.
6. To warrant the grant of the Medal, there must have been 12 Ploughs in actual competition for the medal (*i.e., in the particular class for which the medal was offered*) and not less than £3 awarded in Prizes by the Local Society. The Medal to be given to the winner of the first prize.
7. The Local Society or Ploughing Association shall decide what class of ploughs shall compete for the Medal, and if so agreed, may offer it for competition to the class of plough most generally in use in the district.

8. The Local Society or Committee may, if they desire, arrange to let each Ploughman have one person to guide the horses for the first two and the last two furrows, but in no case shall Ploughmen receive any other assistance, and their work must not be set up or touched by others. Attention should be given to the firmness and sufficiency of the work below, more than to its neatness above the surface.

9. The Local Committee is required to fix the time to be allowed for ploughing the portion of land, and they are recommended that the time be at the rate of not more than fourteen hours per imperial acre on light land, and eighteen hours on heavy or stony land.

NOTE.—The attention of the Directors of the Society has frequently been drawn to certain irregularities which have occurred in connection with the conduct of Ploughing Matches and the completion of the Reports thereon. Complaints have been made (*a*) that the allotted amount of ground has not been ploughed, within the specified time, by the competitor awarded the first prize; (*b*) that the Report sent to this Society has been signed by a Member of the Society who was not present at the Match. It has to be pointed out that any infringement of the above Rules by a Local Society or Ploughing Association will render that Society or Association liable, at the discretion of the Board of Directors, to be debarred from receiving the Society's Medals.

2. MEDALS FOR HOEING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first Premium at Hoeing Competitions, provided a Report on the official form is made to the Secretary within a month of the Competition by a Member of the Society. Forms of Report to be had on application.

RULES OF COMPETITION.

1. All Matches must be at the instance of a Local Society or Hoeing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of its Secretary, must be registered with the Secretary of the Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.

5. A Member can only report one Match; and same Competitor cannot carry more than three Medals in the same season.

6. To warrant the grant of the Medal there must have been twelve hoes in Competition, and not less than Three Pounds awarded in prizes by the Local Society or Association. The Medal to be given to the winner of the first prize.

7. The time to be allowed to be decided by the local Committee, but in no case to exceed two hours for two drills of 100 yards each, the third drill being unoccupied, so that Competitors do not interfere with their neighbour's work.

8. Competitors must finish their work as they go along—no turning back or after-dressing allowed. Hand-picking or transplanting shall be strictly prohibited.

9. A Committee shall be appointed to watch the work, and any Competitor found transplanting or otherwise not complying with the Rules shall have his number withdrawn, and be debarred from receiving any prize which might otherwise have been awarded to him.

NOTE.—Medals will be awarded under similar conditions for Competitions in hand-singling.

3. CERTIFICATES AND MEDALS FOR LONG FARM SERVICE.

Certificates and Silver Medals for long service will be awarded by the Society to farm servants, male or female, having an approved service in Scotland of not less than thirty years (not necessarily continuous) —(*a*) with one employer on the same or different holdings ; (*b*) on the same holding with different employers.

Special Certificates and Gold Medals are also awarded to farm servants, male or female, having an approved service in Scotland of not less than forty-five years (not necessarily continuous), on similar conditions of employment as the above.

Forms of Application are obtainable from the Secretary, 8 Eglinton Crescent, Edinburgh.

War Service to count towards the time required for qualification, where farm servants have returned to same service or employment with same farmer or his family.

The award is strictly confined to **Farm** workers, such as Ploughmen, Cattlemen, and Shepherds.

Domestic and House Servants and Estate workers, such as Foresters, Carters, Grooms, &c., are not eligible.

NOTE —From 14th to 23rd June all communications for the Secretary should be addressed to him at the Secretary's Office, Showyard, Dumfries.

Address for Telegrams—"SOCIETY," EDINBURGH.
Telephone No —EDINBURGH 23655.

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

GENERAL SHOW OF STOCK, IMPLEMENTS, MACHINERY, ETC.

DUMFRIES

21ST, 22ND, 23RD, AND 24TH JUNE 1938.

LAST DAYS OF ENTRY.

IMPLEMENTS AND OTHER ARTICLES—Monday, 4th April.
NEW IMPLEMENTS—Monday, 4th April.
FLOWER SHOW—Saturday, 23rd April.
CATTLE, HORSES, SHEEP, GOATS, AND PIGS—Wednesday, 27th April.
(*Separate Form for* EACH *Entry*)
HORSES IN HARNESS, SHOWN IN VAN OR LIGHT LORRY—Tuesday, 14th June.
DAIRY PRODUCE, RURAL INDUSTRIES, AND HORSE-SHOEING AND SHOE-MAKING—Wednesday, 27th April.
POULTRY—Wednesday, 11th May.
LIVE STOCK JUDGING COMPETITION—Thursday, 12th May.
HONEY and BUTTERMAKING COMPETITIONS—Thursday, 19th May.
HEDGE CUTTING COMPETITIONS—Thursday, 31st March.

President of the Society.

H.R.H. THE DUKE OF GLOUCESTER, K.G., K.T.

Chairman of the Board of Directors.

SIR JOSHUA ROSS-TAYLOR, MUNGOSWALLS, DUNS.

Convener of the Local Committee.

COLONEL F. J. CARRUTHERS OF DORMONT, LOCKERBIE.

Convener of the Shows Committee.

JAMES WYLLIE, TINWALD DOWNS, DUMFRIES.

The District connected with the Show comprises the Counties of Dumfries, Kirkcudbright, and Wigtown.

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REGULATIONS.

GENERAL CONDITIONS.

1. The Competition, except where otherwise stated in the Premium List, is open to Exhibitors from all parts of Great Britain, Northern Ireland, and Eire (Irish Free State).

Entries. 2. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary *not later than Monday, 4th April, for Implements, New Implements, and other Articles ; Saturday, 23rd April, for Flower Show ; Wednesday, 27th April, for Stock, Dairy Produce, Rural Industries, and Horse-shoeing and Shoe-making ; Wednesday, 11th May, for Poultry ; Thursday, 12th May, for Live Stock Judging Competition ; Thursday, 19th May, for Honey and Buttermaking Competitions ; Tuesday, 14th June, for Horses in Harness, to be shown in Van or Light Lorry.* Printed forms of Entry will be issued on application to the Secretary, No. 8 Eglinton Crescent, Edinburgh 12. Admission Orders for Exhibits and Attendants will be forwarded to Exhibitors, by post, previous to the Show.

Substitution of Entry in same Class. Between 27th April and 26th May an Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep, Goats, or Pigs, in a particular class, will be permitted to substitute for it an entry of another animal in the *same class* on payment of a fee of Five Shillings each entry.

Attested Herds and Grade 'A' (T.T.) Herds. Cattle from Attested Herds and from Grade 'A' (T.T.) Herds are housed separately, in accordance with Government Regulations, and particulars must be given on the Entry Form. In the event of any licence being issued or revoked after the date of entry, intimation must be made immediately to the Secretary, and in any case not later than 1st June, after which date no change in the housing accommodation can be made.

Licences for moving Stock. 3. This Premium List is published and the Show will be held subject to any Orders that may be issued by the Ministry of Agriculture or Local Authorities. Any licences that may be required for the movement of Stock into or away from the Show must be obtained by Exhibitors. For these licences application should be made to the Chief Constable, Dumfries.

Diseased Animals. 4. Animals suffering from any form of infectious or contagious disease—including ringworm or other form of infectious or contagious skin ailment—must not be brought to the Show. Those infringing this Rule shall be liable to a fine of 40s., and to have their Stock removed.

Horses suffering from cold. The Steward of Horses shall have power to require that any animal showing symptoms of cold be examined by the Veterinary Surgeon, and, if found to be so suffering, the animal shall be isolated or excluded from the Showyard.

Fees to accompany Entries. 5. No Entry can be received or recorded unless it is accompanied by the necessary fees, and complies fully with the Regulations in the Premium List, the Secretary being empowered to return entries sent without the necessary fees.

Particulars of Entries. 6. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor. The Society shall have power at any time to call upon an Exhibitor to furnish proof of the correctness of any statement in his entry.

Name of Breeder. 7. The name of the Breeder, if known, must be given, and if the Breeder is not known, a declaration to that effect, signed by the Exhibitor, must be made on the Entry Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

No Substitution of Animals. 8. All animals, except calves, foals, and lambs shown with their dams, must be entered in the classes applicable to them, and cannot be withdrawn after entry, or other animals be substituted in their place, except as provided in Rule 2.

One Class only. 9. For Prizes given by the Society, no animal shall be allowed to enter in more than one class, or to compete in any class except that prescribed for animals of its pedigree and description; but this Rule does not apply to the Jumping Classes.

Ownership. 10. All stock exhibited at the Show, except where otherwise stated in the Premium List, must be, at the time of entry, the *bona fide* property of the Exhibitor in whose name it is entered.

Responsibility for Entries. 11. Exhibitors are alone responsible for the accuracy and eligibility of their entries. The recording of an entry or the admission of the exhibit to the Showyard will not relieve the Exhibitor of this responsibility. The entry fee paid for an animal entered in a class for which it is not eligible is not returnable.

Cancelling of Entries. 12. In the event of the entries in any section of Cattle, Horses, Sheep, Goats, or Pigs being less in number than an average of three per class, or the number of different Exhibitors in the section being less than three, the classes for that section shall be cancelled automatically for the year and the entry fees returned.

Society not liable. 13. The Society shall not be liable for any loss or damage which Stock, Poultry, Dairy Produce, &c., Implements, or other articles may sustain at the Show, or in transit.

Disqualified Exhibitors. 14. The Society reserve to themselves the right of refusing, cancelling, or prohibiting the exhibition of entries from any person who, after 1st January 1904, has been expelled from the membership of any Agricultural or Dairy Society, or who may have been prohibited, suspended, or disqualified from making entries or exhibiting at the Show or Shows of any Agricultural or Dairy Society or Breed Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, or who is under exclusion from any Breed Society for fraudulent practices.

Animal Disqualified. 15. When an animal has previously been disqualified by the decision of any Agricultural or Breed Society in the United Kingdom, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity.

Tampering with Animals. 16. Any artificial contrivance or device of any description found on or proved to have been used on an animal, either for preventing the flow of milk or for any other improper purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal may be prohibited from again entering Stock for any of the Society's General Shows, for such a period as the Directors may see fit.

17. Horses shall not be blindfolded while being shown in the Ring. *Blindfolding Horses.*

18. The Society further reserve to themselves the right of refusing any entries they may think fit to exclude, or to cancel any entry made, or to prohibit the exhibition of any entry. *Rejecting Entries.*

19. Stock entered for competition, and actually in the Show, is subject to the control and under the orders of the Stewards, Secretary, and other Show officials of the Society, and such stock may not be withdrawn from competition without the consent of the Stewards or Secretary. *Control of Exhibits.*

20. Persons making insulting remarks to, or in any way unduly interfering with, the Judges, Stewards, or other officials while in the performance of their duties, and all Exhibitors or others in charge of stock while in the Judging Rings refusing to accept or display tickets, rosettes, &c., awarded by the Judges, and handed to them by the Stewards or other officials, or tearing up tickets, rosettes, &c., so awarded and handed to them, or indulging in any similar conduct, shall be considered guilty of misconduct, and shall be dealt with under these rules. *Improper Conduct.*

21. All persons in charge of stock or other exhibits, and all persons admitted into the Showyard, shall be subject to the rules of the Society, and shall obey the orders of the Stewards, Secretary, and other officials of the Society. Exhibitors shall be answerable for the conduct of their servants or representatives. *Subject to Orders.*

The Stewards and other officials have power to enforce the Regulations of the Society in their different departments. *Power of Officials.*

22. A protest having reference to exhibits at the Show may be lodged by any person having interest. Protests having reference to competitions which take place on the first day of the Show must be lodged in writing with the Secretary at his Office in the Showyard not later than 9 A.M. on Wednesday, the second day of the Show, and parties must be in attendance at the Secretary's Office in the Showyard at 9.30 A.M. that day, when protests may be disposed of. Protests relating to competitions taking place after the first day of the Show must be lodged before 5 P.M. on the day on which the particular exhibition takes place. Each protest must state specifically the grounds of objection, and must be accompanied by a deposit of £2, 2s., which deposit may, if the objection be proved frivolous to the satisfaction of the Directors, be forfeited. Protests may be lodged at any time by Directors, and in this case no deposit will be required. Protests will be heard and determined by the Directors. Protests on veterinary grounds not received. *Protests.*

23. The violation of any one of the Regulations, or disobedience of the orders of the Directors, Stewards, Secretary, or other officials of the Society, shall render the offending person liable to the forfeiture of all Premiums awarded to him, or of such a portion as the Directors may ordain, and also liable to be expelled from the membership of the Society, and disqualified from again, or for a certain number of years, exhibiting at the Shows of the Society, or to have his case disposed of by fine or otherwise as the Directors may determine. *Penalties for Offences.*

24. The decision of the Directors shall, in every matter arising at or in connection with the Show, be final; and every person present at the Show, whether as a Judge, Exhibitor, Visitor, or otherwise, shall be deemed thereby to have agreed to refer the subject-matter of such decision to the final determination of the Directors to the exclusion of all Courts of Law. *Final Authority.*

Intimating Decisions. 25. All decisions under these Rules may, along with the names and addresses of the persons against whom such decisions have been pronounced, be communicated by the Secretary of this Society to the Secretaries of all Agricultural or Dairy Societies holding open Shows in the United Kingdom, and to the Secretaries of all Breed Societies in the United Kingdom, and may be published in the Annual Reports of this Society, and in such newspapers or journals as the Directors may determine; and every Exhibitor competing at the Show, and every person present at the Show, whether as a Director, Member of Committee, Steward, Judge, Exhibitor, Visitor, or otherwise, shall be deemed thereby to have consented to such communication and publication.

Former Winners as Extra Stock. 26. An animal to which a first Premium has been awarded, even if it should not qualify for that Premium, or an animal which subsequently becomes entitled to a first Premium, at a General Show of the Society, cannot again compete in the same class, notwithstanding any alteration in the heights stated for such class, but may be exhibited as Extra Stock (see page 129).

Herd-books. 27. Shorthorn, Aberdeen-Angus, Galloway, Belted Galloway, Highland, and British Friesian cattle must be entered in the herd-books—Ayrshire Cattle in the herd-book or any Appendices thereto—or the Exhibitor must produce evidence that his animal is eligible to be entered therein. Dun Galloways entered in the ordinary Galloway Classes must be registered in, or eligible for entry in, the Galloway Cattle Society's herd-book.

Height of Horses. 28. All Horses or Ponies entered in classes in which a particular height is stated shall, before being judged, be measured with their shoes on. No subsequent measuring or alteration of shoes will be permitted. In the case of Highland and Western Island Ponies, these may be measured without shoes, the height limit in such cases being reduced by quarter of an inch.

Weight of Shoes. 29. Exhibitors of Hackney and Harness Horses shall be required to adhere to the Rules and Regulations of the Hackney Horse Society with regard to the weight of shoes on their exhibits, the Society's Veterinary Inspector being instructed to examine all the Hackneys and Harness Horses on the second morning of the Show and see that the following Rules as to the weight of shoes are attended to—viz., (*a*) For Hackneys exceeding 14 hands (except Hackney yearling colts and Hackney yearling fillies), no shoe (nails included) may exceed 2 lb. in weight; (*b*) for Ponies not exceeding 14 hands, Hackney yearling colts and Hackney yearling fillies, no shoe (nails included) may exceed 1½ lb. in weight.

Overfeeding. 30. Breeding Stock must not be shown in an improper state of fatness, and the Judges are requested not to award Premiums to overfed animals. No Cattle which after the age of twelve months have been exhibited as Fat Stock at any Show are eligible to compete in the Breeding Classes for the Society's Prizes until one year after being so shown, and then only with calf at foot. No Sheep which after the age of twelve months have been exhibited as Fat Stock at any Show are eligible to compete in the Breeding Classes for the Society's Prizes.

Sires. 31. Aged Bulls and Stallions must have had produce, and, along with two-year-old Bulls, three-year-old Colts, and two-shear and aged Tups, have served within the twelve months immediately preceding the Show.

Calving Cows. 32. Except as may be otherwise specially provided in this Premium List, cows of all breeds (other than Ayrshire and British Friesian) must have had a live or full-time calf on or after 1st September of the year preceding the year of the Show, and before the first day of the Show, and when exhibited must be in milk. Cows of the Ayrshire and British Friesian breeds must have had a live or full-time calf within fifteen months previous to the Show. *Animals of any age that have had a calf must be shown as Cows.*

In-calf Heifers.

33. Two-year-old Heifers of the Shorthorn, Aberdeen-Angus, Galloway, Belted Galloway, Ayrshire, and British Friesian breeds, and three-year-old Highland Heifers, must be in calf when exhibited, and the Premiums will be withheld till birth be certified, which must be within nine months after the Show.

Mares.

34. A Mare entered in a class for "Mares with foal at foot" must have produced a foal after 1st January of the year of the Show, must have regularly nursed her own or another foal, and must (except where otherwise provided) have the foal with her in the Show. If the mare's own foal is alive it must be the foal shown with the mare. In the case of a Mare that has not foaled before the Show, or whose foal has died, she shall, if not in milk, be eligible without further entry to compete among the Yeld Mares if a corresponding class for Yeld Mares be included in the Premium List. Draught Yeld Mares must produce a foal not later than 1st August of the year following the year of the Show. A Mare in a class for "Mares or Geldings" may or may not have had a foal in the year of the Show, but shall not have her foal exhibited with her, nor be in milk at the time of the Show.

Sows.

35. All Sows born in or before 1936 must have produced a litter of pigs in the year of the Show before the opening day. Sows born between 1st January and 1st September 1937 must either have produced a litter of pigs before the Show, or produce a litter within three months of the last day of the Show. Certificates of the date of farrowing must be supplied in every case.

Calves and Foals. Calving, Farrowing, and Foaling Certificates.

36. With reference to Regulation 33, birth of a live or full-time calf must be certified; and in regard to Regulation 34, birth of at least a nine months' foal; or in the case of the death of the dam, a Veterinary Surgeon's certificate must be produced certifying that at the time of death the animal was so far advanced with calf or foal that if it had lived it would have produced a full-time calf or foal within the periods stated in Regulations 33 and 34. Certificates required by the foregoing Regulations will be issued after the Show, and must reach the office of the Secretary as follows: calving certificates within ten months, foaling certificates within thirteen months, and farrowing certificates within four months, of the last day of the Show. In default of this, the animal will be regarded as having failed to fulfil the Regulations, and the Prize will therefore pass to the animal next in order of merit or be forfeited.

Special Prizes.

37. Except when otherwise provided, the awards of Special Prizes shall not be subject to the Regulations as to calving, foaling, and farrowing.

Payment of Prizes.

38. The Premiums awarded, except those withheld till birth of calf or foal or litter of pigs is certified, will be paid as soon after the Show as practicable, and, with the exception of the Tweeddale Gold Medal, Special Cups, and Medals, may be taken either in money or in plate.

Veterinary Examination of Stallions and Colts.

39. No Stallion or entire Colt, two years old or upwards, shall be allowed to compete for any of the Society's Prizes unless it has previously been licensed for stud purposes during the current year by the Department of Agriculture for Scotland, the Ministry of Agriculture and Fisheries, or the Irish Departments of Agriculture.

Soundness of other Horses. *Accommodation for Examination.* 40. Judges are particularly requested to satisfy themselves, as far as possible, regarding the soundness of all Horses before awarding the Prizes, and to avoid giving Prizes to animals showing symptoms of hereditary disease. The Judges may consult the Society's Veterinary Surgeon if they deem it expedient. Private accommodation is provided for the examination of horses by the Veterinary Surgeon. No protests on veterinary grounds will be received.

Ewes. 41. Every Ewe must have given birth to and reared a lamb in the year of the Show; and Ewes of the Blackface and Cheviot breeds must be in milk, and have their lambs at foot.

Milking. 42. Animals in milk of the Dairy breeds must be milked dry at 6 o'clock on the evening previous to the opening of the Show in the presence of, and to the satisfaction of, the Steward of Cattle or a representative of the Society duly authorised by him. Animals arriving after six o'clock will be milked dry at the time of arrival.

All animals in milk, in the Ayrshire Cattle Classes, must be milked out in the ring before the awards are made.

Clipping. 43. Sheep must have been clipt bare after the first day of the November preceding the Show, no part of the animal to be clipt prior to that date—this Rule not to apply to Cheviot Sheep and Oxford Down Sheep.

No Blackface Sheep shall be eligible which has not been clipt bare on or after the 1st April of the year of the Show. (This rule does not apply to Lambs.)

Colouring, &c., of Sheep and Pigs. 44. The Steward of Sheep, who can call in assistance if so desired by him, shall have full power to disqualify any pen of Sheep which he considers coloured, other than by the use of ordinary non-bloom dips free of added colouring matter, or when the fleece, face, or legs have been dealt with by the use of foreign substances.

The use of artificial whitening or powder on Large White Pigs is prohibited, and the Judge is empowered to disqualify any pig so whitened or powdered.

Flock Books. 45. All Oxford Down and Suffolk Sheep shown must be entered or eligible for entry in the Oxford Down and Suffolk Flock Books respectively.

Poultry. 46. * In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.

Railway Passes. 47. Railway Certificates for Stock, for both outward and return journeys, will be issued to Exhibitors before the Show along with their Tickets of Admission (see page 98).

Admission of Stock. 48. Stock and Poultry will be admitted on Monday, the day before the opening of the Show, and, with the exception of Horses, must be in the Yard before 12 o'clock that night. Horses must be in before 8 o'clock on the morning of Tuesday, except those entered in classes for which other times for arrival are elsewhere stated in this Premium List. Judging begins at 9.30 A.M. on Tuesday. Stock and Poultry will be exhibited on Tuesday, Wednesday, Thursday, and Friday. Any animals selected by the Stewards may be required to take part in the Stock Judging Competition on the Thursday. Stock may be admitted on the Saturday preceding the Show, but only by sending two days' prior notice to the Secretary's Office in the Showyard.

Parades. 49. Horses and Cattle must be paraded at the times stated in the Programme of the Show, and when required by the Stewards, and under their direction. Females of the Highland Cattle breed born in or after 1927 must be paraded; those born before 1927 will be paraded at the option of the Exhibitor. In Parade, Horses must be ridden or led as provided in their respective classes. Prize and commended Cattle and Horses will receive two rosettes each, which must be attached to the head of the animal, one on each side. Attendants must be beside their animals *forty-five minutes before the hour of Parade,* and be ready to proceed to the ring immediately on receiving the order of the Stewards. Infringement of this Rule, or failure of any attendant to obey the orders of the Society's officials, will render the Exhibitor liable to a fine of 20s. for each separate infringement or act of disobedience, and to the forfeiture of any or all of the Prizes awarded to him at this Show.

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* In 1939 this Rule will be altered so that Cockerels and Pullets shall be eligible which were hatched after 1st November of the year preceding the Show.

Responsibility of Exhibitors.

50. Exhibitors shall be answerable for all acts, whether committed by themselves, their servants, or others in charge of their Stock, and shall be responsible for the condition of their animals during the whole time they remain in the Showyard.

Moving from Stalls.

51. No animal shall be taken out of its stall after 10 A.M. during the Show except by order of the Stewards, or with permission of the Secretary.

Washing Cattle.

52. Cattle shall not be taken out of their stalls to be washed after the Judging has commenced. Cattle must not be washed beside the Judging Rings. Those infringing this Rule shall be liable to a fine of 10s.

Soaping prohibited. Colouring matter.

53. Soap or other adhesive material must not be used in dressing cattle or horses. The use of blacking or other colouring matter on cattle is prohibited. Infringement of this Rule will render the animal upon which the material is used liable to be disqualified.

Loose-boxes and Stalls.

54. Loose-boxes will be provided for all horses; covered accommodation for other live stock. Stalls for nurse cows charged at ordinary rates. Boxes (floored) for attendants on Cattle, Horses, Sheep, Goats, and Pigs will be provided at a charge of 40s. for each box for members; 50s. for non-members. (See Rule 79.)

Floored Boxes and Stalls for Animals.

55. Exhibitors requiring the boxes, stalls, or pens for their animals to be floored must give instructions, stating the Catalogue No., to the Society's Showyard Erector, Mr John Reid, Showyard, ten days before the Show opens. (For charges, see Rule 78.)

Securing Cattle.

56. Bulls must be secured by nose-rings, with chains or ropes attached, or with strong halters and double ropes. All Cattle, other than Highland Cattle, must be tied in their stalls.

Concealing Animals.

57. During the time the Show is open to the public no rug shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of that department.

Fodder.

58. Five days' supply of straw, hay, grass, and tares will be provided free by the Society. Any additional fodder or other kinds of food required will be supplied at fixed prices in the Forage-yard. The Forage-yard will close at 1.30 P.M. on Friday, the last supply to be given to attendants then; and if any extra supply is required on account of stock remaining in the Yard after the close of the Show, notice must be given to the Forage Steward not later than 5 o'clock on Thursday. Any servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not *grass, tares, hay, or straw.* Coops, food, and attendance for Poultry will be provided by the Society.

Feeding appliances. 59. Servants in charge of Stock must bring their own buckets or pails and a piece of rope or sheep-net to carry their forage. Mangers, and sheep and pig troughs, will be provided.

Sawdust. 60. Sawdust must not be used as bedding for Stock.

Water. 61. As the command of water in the Yard is limited, it is particularly requested that waste be avoided.

Lights and Smoking. Closing of Gate. 62. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the Sheds. Those infringing this Rule shall be liable to a fine of 10s. The gates will be closed at midnight, and no person shall be allowed to enter or leave the Yard between that time and 5 A.M. without a special permit.

Removal of Stock. 63. Stock or Poultry cannot be removed from the Yard till 5 P.M. on Friday, the last day of the Show, except on certificate by the Veterinary Surgeon employed by the Directors, countersigned by the Steward of the department or the Secretary.

Withdrawal of Horses overnight. 64. At the close of the Show on Tuesday, Wednesday, and Thursday, horses may be withdrawn for the night on a deposit of £5 for each animal, which shall be forfeited, along with any prize money it may have gained, if the animal is not brought back. They must return between 7 and 7.30 the following morning, and those not in before 8 shall forfeit 10s. Horse passes to be applied for at the Secretary's Office between 5 and 6 P.M. on Tuesday, and the deposit, unless forfeited in whole or in part, will be returned between 12.30 and 2.30 on Friday.

Order in removal. 65. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule shall be liable to a fine of 10s., and to be detained till all the other Stock is removed.

Penning and removing Poultry. 66. Poultry may be penned before the opening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor an authorised representative of the Exhibitor being present to pen or remove Poultry, the birds will be penned and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to Exhibits by errors or accidents in penning, despatching, or conveying Exhibits.

Closing of Poultry Shed to Public. 67. On the opening day of the Show the Poultry Shed will be closed to the public during the Judging. On the last day of the Show the Poultry Shed will be closed to the public at 4 P.M.; at 5 P.M. Exhibitors or their representatives will be admitted to the Shed to remove Exhibits, provided the Exhibitor has, *not later than* 11 A.M. *on the last day of the Show,* given written notice to the Secretary to the effect that the Exhibitor or the Exhibitor's representative will attend at the Poultry Shed at 5 P.M. to remove the birds.

JUDGING STOCK AND POULTRY.

Opening Gates. 68. On Tuesday, the first day of the Show, no person will be admitted, except Servants in charge of Stock, till 8 A.M., when the Gates are opened to the public.

Judging. 69. The Judges will commence their inspection at 9.30 A.M. The spaces reserved for the Judging will be enclosed, and no encroachment thereon shall be permitted.

Insufficient merit.

70. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit; and where only one or two lots are presented in a class, and the Judges consider them unworthy of the Premiums offered, it shall be in their power to award a lower prize.

Commendations.

71. In addition to the Premiums, the Judges may award **one** Very Highly Commended, **one** Highly Commended, and as many Commended tickets in each class as they consider justified by the number and merit of the entries.

Ayrshire and British Friesian Cows and Heifers.

72. Ayrshire and British Friesian Cows which have not calved before the Show, whether entered in a class for Cows in Milk or for Cows in Calf, shall be judged along with the Cows in Calf, and Ayrshire and British Friesian Cows or Heifers which have calved before the Show—in whichever of the classes entered—shall be judged along with Cows in Milk. Heifers entered in a Milk Class, which have not calved before the Show, will be judged along with Heifers in Calf.

Attending Members' duties.

73. Attending Members will accompany the Judge of each section. It will be the duty of Attending Members to bring the animals out to the Judges and to see that no obstruction is offered to them, and that the space reserved for them is not encroached upon; to ticket the prize animals; to send the Nos. of the prize animals to the Award Lectern near the Secretary's Office; to assist the Judges in completing their return of awards; and should any difficulty arise, to communicate with the Stewards or Secretary.

74. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or Attending Member in any class in which he is competing.

DAIRY PRODUCE.

75. Dairy Produce will be received in the Showyard on Monday, the day before the opening of the Show, and till 8 A.M. on Tuesday, the first day of the Show. Judged at 9.30 A.M. on Tuesday. Exhibited Tuesday, Wednesday, Thursday, and Friday.

Placing and removing Dairy Produce.

76. Dairy Produce must have been made on the Exhibitor's farm in the year of the Show. No Exhibitor shall show more than **one** lot in each class. Exhibits of Dairy Produce may be placed before the opening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor a person with written authority from the Exhibitor being present to place or remove exhibits, they will be placed and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. In the case of exhibits which are not removed by 5.30 P.M. on the closing day of the Show, the Society will hold itself at liberty to hand them over to the railway companies for despatch to the respective Exhibitors

STALL RENT.

Stall Rents

77. The Stall Rents (which include Entry Fees), as stated opposite the individual classes in this List, shall be paid by Exhibitors when making their entries. The Secretary is instructed to return entries sent without the necessary fees.

FLOORED BOXES AND STALLS.

Floored Stalls for Animals.

78. Exhibitors desiring the boxes, stalls, or pens for their animals to be floored can have this done by giving instructions, stating the Catalogue No., ten days before the opening of the Show, to the Society's Showyard Erector (Mr John Reid, Showyard, Dumfries), to whom the following charges for flooring have to be paid: Horses, 30s. each; Ponies, Cattle, Sheep, Goats, and Pigs, 20s. each.

ACCOMMODATION FOR ATTENDANTS.

Accommodation for Attendants.

79. Boxes for accommodation of attendants on Stock will, if desired, be provided beside the Stock at a charge of 40s. per box for members and 50s. for non-members. Attendants' boxes will be floored and lined with wood, with door. Applications for attendants' boxes must accompany entries of Stock, and in the case of all Horses, Exhibitors must state, at the time of entry, the animal next to which the attendant's box is to be placed. Attendants' boxes in the Cattle, Sheep, Goat, and Pig Sections will be erected at the end of each run of shedding, and where an Exhibitor has more than one animal the application must indicate the animal nearest to which the Attendant's Box is required. **Attendants' boxes cannot be guaranteed after the closing date.**

IMPLEMENTS AND OTHER ARTICLES.

Admission of Goods.

80. Implements will be received in the Yard from Tuesday, 7th June, till 5 o'clock on the afternoon of Monday, 20th June. Exhibited Tuesday, Wednesday, Thursday, and Friday. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor, and prices must be stated.

Premiums.

81. No Money Prizes or Medals, except when specially offered, will be given by the Society for Implements of any kind.

Refusing Entries.

82. Agricultural Implements, and Implements and collections of articles not Agricultural, will be received for Exhibition, but the Secretary is entitled to refuse entries from dealers in articles not deemed worthy of Exhibition.

Local Operatives.

83. In order to encourage exhibits of Agricultural Implements from operative Blacksmiths and Carpenters in the district of the Show, open space will be provided for these in some less prominent part of the Yard at a charge of £1 for space 10 feet wide and 20 feet deep.

Articles not entered.

84. Every article to be exhibited must be entered on the Society's Entry Form. Any article not so entered that is taken to the Show is liable to be ordered out of, or removed from, the Showyard, or confiscated to the Society. Exhibitors infringing this Rule are moreover liable to a fine of £1.

Selling by auction and noisy behaviour forbidden.

85. "Cheap-Jacks" are not admitted to the Showyard. The selling of goods by auction, shouting, and other behaviour calculated to annoy visitors or Exhibitors, are strictly forbidden. The use of mechanical loud-speaking appliances is also prohibited. Exhibitors infringing this Regulation are liable to a fine of £1, and to have themselves and their goods ordered out of, or removed from, the Showyard, or to have their goods confiscated to the Society.

Placing Exhibits. Removing Exhibits.

86. The articles of each Exhibitor must all be placed in one Stand, except Implements in motion, and must not on any account extend beyond the allotted space. No article shall be moved out of its Stand, or the Stand dismantled, till the termination of the Show, at 5 P.M. on Friday.

Restoring Turf.

87. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor. Failing this being done, the Society shall be at liberty to restore the ground and charge the cost to the Exhibitor.

Arranging Exhibits. Signs.

88. Exhibitors must arrange their own articles *within* the space allotted to them before 9 o'clock on Tuesday, the first day of the Show, and to the satisfaction of the Stewards in charge of the Implement Yard. Exhibitors are prohibited from sub-letting space allotted to them, and from displaying the name of any other firm on their Stand. All signs, except signs on gables, must face the front only. Nails must not be driven into the canvas.

Handbills.

89. Exhibitors are not allowed to distribute handbills anywhere in the Yard except at their own Stand; and they must not for this or any other purpose encroach upon the adjacent alleys or open spaces.

Sweeping Stands, &c.

90. Exhibitors are required to have their Stands and the portions of the alleys immediately adjoining them swept up before eight o'clock on each morning of the Show.

Fuel.

91. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. *Coke only shall be used in all cases where fire is required.* Coal shall not be used at any time in the Showyard. Those infringing this Rule shall incur a penalty of £5.

Steam Engines.

92. No Steam Engine shall be driven in the Yard at a greater speed than 4 miles an hour. Traction Engines shall not be used in conveying Exhibits or other goods into or out of the Showyard or from one place to another therein.

Traction Engines.

93. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary or Stewards, and must not leave their Stands till 6 P.M. on Friday.

Consigning Implements.

94. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the Implement, as well as the number of the Exhibitor's Stand.

95. The carriage of all Implements must be prepaid.

Photographing in Showyard.

96. Photographing in the Showyard is not permitted, except by photographers having a Stand in the Showyard or holding a "Photographer's Ticket." The "Photographer's Ticket" may be had from the Secretary, price 20s. It admits the holder to the Show when open to the public, and entitles him to photograph in the Showyard, subject to arrangements made by the Stewards. It does not entitle the holder to sell photographs in the Showyard. No photographer shall be allowed in the ring during Parades, except with the sanction of the Steward of Parades.

Offices. 97. Covered Booths for Offices (9 feet by 9 feet), purely for business, not for exhibition of goods, can be had for £5 to Members and £7 to Non-Members.

Exhibitors' and Attendants' Tickets. 98. Each Exhibitor in the Implement Department who is not a Member of the Society will receive one free Ticket of Admission to the Showyard for himself or a member of his firm. All Exhibitors will receive, for the use of attendants employed by him at his Stand, two Tickets of Admission for each complete ten feet of shedding in the Motion Yard, and one Ticket for each complete ten feet of shedding in the other sections. No additional Free Tickets can be issued in any circumstances whatever. Additional Attendants' Tickets, not more than three for each ten feet of frontage, and in no case exceeding a maximum of twenty for one Exhibitor, may be obtained by application in writing by the Exhibitor at 5s. each. *No tickets will be issued without an Order.*

Tickets to be filled up and signed. 99. The Tickets of Admission for Exhibitors and Attendants referred to in the foregoing Regulations will (about fourteen days prior to the Show) be issued to the Exhibitors in blank, with the number of the Exhibitor's Stand. The name of the person for whom each Ticket is intended must be written on it before it is used. Each person holding a Free Ticket of Admission must sign his or her name on the back thereof, and must also, when required, sign his or her name in the book at the Entrance Gate. Exhibitor's attendants are strictly cautioned not to lend or transfer their Tickets, which can be used only by the persons whose names they bear, and who must be *bona fide* acting for, or employed by, the Exhibitor. No ticket is transferable. An Exhibitor is liable to a fine of £1 for each case of transfer or other improper use of a Ticket issued to himself or employee. *Tickets not Transferable. Improper use of Tickets.*

Admission of Supplies for Stand-holders. 100. The following are the arrangements for the admission of Supplies (Refreshments or other goods) for Stand-holders during the Show: Messenger on foot (with or without hand-barrow), with supplies, admitted by Special Ticket; price for one admission, 2s., for six admissions, 10s. Motor or horse vehicle and driver, with supplies, admitted by Special Ticket; price for one admission, 2s. 6d., for six admissions, 12s. These Special Tickets may be had from the Secretary. Vehicles, with supplies, will be admitted to the Showyard only between *Seven o'clock and Nine o'clock*, on each morning of the Show, except by written permit from the Secretary.

Vehicles, with a carrying capacity of more than 2 tons, will not be admitted to the Showyard at any time, except by special permit from the Secretary. This rule will be strictly enforced.

101. Motor Lorries, Vans, or other vehicles belonging to Stand-holders, will not be allowed to remain in the Showyard during the period of the Show. Vehicles conveying exhibits to Stands prior to the Show must follow the routes indicated by the Society's officials, and must leave the Showyard immediately on completing delivery. Motor Cars conveying passengers will not be permitted to enter the Showyard.

Cycles. 102. The riding of Cycles in the Showyard is prohibited.

Accidents. 103. The Society will not be responsible for any accident that may occur from the machinery belonging to any Exhibitor; and it is a condition of entry that each Exhibitor shall hold the Society harmless, and indemnify it against any legal proceedings arising from any accident caused by his machinery.

Alcoholic Drinks. 104. The giving of Alcoholic Drinks to visitors at Stands in the Show is strictly prohibited. With a view to the enforcement of this rule the Society reserves the right of unrestricted access, by its authorised representatives, to all Exhibitors' Stands during the Show.

Gas and Electric Power.

105. Exhibitors desiring the use of gas in the Showyard should apply to the Manager, Gas Works, Dumfries, and those desiring electric power should apply to Messrs Pratt Bros. (Edinburgh), Ltd., 3 West Park Place, Dalry Road, Edinburgh, in both cases not later than 15th May.

Water.

Exhibitors desiring water laid on to their Stands should apply to the Society's Master of Works, 8 Eglinton Crescent, Edinburgh, not later than 15th May. Water will be laid to Exhibitors' Stands according to the following flat rates, irrespective of position in the Showyard—viz.: ¾-inch supply, with ¾-inch cran, £3; ½-inch supply, with ½-inch cran, £2, 15s. Additional crans or any extra fittings, such as sinks, &c., by arrangement.

Space for Stands.

106. * Ground to be taken in spaces of 10 feet frontage. Exhibitors must take their space in one or other of the Sections listed under Rule 110. Space is not let partly covered and partly open.

Exhibits not in Motion.

Exhibits not in motion may be excluded from the Motion Yard. The space in the Motion Yard being limited in extent, and intended mainly for exhibits in motion, not more than one-fifth of the space allotted to any one Exhibitor—and in no case more than 600 square feet—may be occupied in the Motion Yard by exhibits not in motion.

Maximum Space.

107. The maximum extent of space which any one Exhibitor may apply for shall be 60 feet of frontage in the Motion Yard, and 120 feet of frontage in the other Sections.

Allocation of space.

108. The Society reserves the right to allot to applicants for Stands either the whole or part of the space they ask for.

Fitting up of Stands.

109. Exhibitors requiring work executed in connection with the fitting up of Stands allotted to them must employ the Society's Showyard Erector—Mr John Reid, 55 Blenheim Place, Aberdeen. The execution of orders received later than ten days before the opening of the Show cannot be guaranteed.

110. Rates for space, payable by Exhibitors when making their Entries :—

	Members.	Non-Members.
1. Open ground without Shedding, 20 ft. deep, per 10 ft. frontage	£2 0 0	£2 15 0
2. Open space without Shedding, 40 feet deep, per 10 feet frontage	4 0 0	5 10 0
3. Shedding, 20 ft. deep, 7 ft. to eave, per 10 ft. frontage	3 0 0	3 15 0
4. Shedding, 20 ft. deep, 7 ft. to eave, *close boarded at back*, per 10 ft. frontage	5 0 0	6 0 0
5. Main Square, without Shedding, for erection of Exhibitor's own Pavilion (construction of which must be approved by Society), 50 ft. deep, per 10 ft. frontage	6 0 0	7 10 0
6. †Motion Yard, without Shedding, 55 ft. deep, per 10 ft. frontage	4 10 0	6 0 0
7. †Motion Yard, with Shedding (10 ft. open behind, 20 ft. covered, and 25 ft. *open in front*), 11 ft. to eave, per 10 ft. frontage	6 0 0	7 10 0
8. Special Section for Motor Vehicles, 30 ft. deep (20 ft. covered and 10 ft. *open in front*), 11 ft. to eave, per 10 ft. frontage	5 0 0	6 0 0
9. Covered Booths for offices, 9 ft. by 9 ft., each	5 0 0	7 0 0
10. Press offices, 9 ft. by 9 ft., each £4.		

† See Rules 106 and 107.

Tents and marquees not allowed in the Showyard. All internal fittings to be executed by the Exhibitor at his own expense. The Society's Showyard Erector must be employed. See Rule 109.

* Special provision may be made for Exhibitors of both machinery in motion and implements and machinery not in motion on application being made to the Secretary.

FLOWER SHOW.

See also Regulations 80 to 109.

1. Exhibits in this section may comprise collections of flowers, fruits, plants, or shrubs, formal gardens, and rock gardens.

2. Application for space, for which no stand rent or entry fee is payable, must be made on special entry forms, to be obtained from the Secretary and lodged on or before 23rd April. Entry forms must give full details of each exhibit and the amount of space required. Space, which may be either covered or open, will be allocated in sections of 10 feet each, with a depth of 20 feet, and a maximum of 60 feet frontage for any one exhibitor. For space without shedding special consideration will be given to applications from exhibitors desiring a greater depth than 20 feet. Staging will be provided free of charge.

3. The Society reserves the right to refuse any application for space, or to limit the amount of space to be allocated to any exhibitor.

4. Each exhibitor shall receive one exhibitor's ticket and, in addition, two attendants' tickets for each 10 feet of frontage. Additional attendants' tickets, not more than three for each 10 feet of frontage, and in no case exceeding a maximum of twenty, may be purchased at a price of 5s. each. *No tickets will be issued without an order.*

5. All exhibits must be in position not later than 5 P.M. on Monday, 20th June, with the exception of cut flowers, which may be staged up till 8 A.M. on Tuesday, 21st June. Stands must remain open until the Show closes on each of the four days.

NEW IMPLEMENTS.

1. Entries of New Implements for the Society's Silver Medal must be made on or before 4th April. Entries shall be made on a special form obtainable from the Secretary, and must define clearly the exact nature of the novelty which qualifies such implement to be entered for a Medal. Unless the "New Implement" be properly described in the specification, and particulars of its novelty are given at the time of making the entry, it will not be accepted.

2. For each entry of a "New Implement," a non-returnable Entry Fee of £1 will be charged.

3. In cases of sufficient merit, the Judges will recommend the award of the Society's Silver Medal to New Implements for agricultural or estate purposes, or to new improvements in such implements.

4. The Society does not bind itself to try in the field every "New Implement" entered for a Silver Medal, but in general a practical trial will be required before an award is made. The Judges shall report to the Directors those cases in which they consider a practical trial necessary.

5. Where intimation is received by the Secretary, not later than the 25th April, that a "New Implement" is ready for trial, the Directors may arrange for a practical trial before the Show at a place and date to be decided upon. In other cases the practical trial of New Implements will take place after the Show.

6. Any Exhibitor who expresses a wish to do so can, with the sanction of the Steward of Implements, at his own expense take

his New Implement out of the Showyard during the Show week and put it to work, and, if within a reasonable distance, the Judges will, if they deem it necessary, inspect it at work and decide if it is worthy of a Silver Medal.

7. No Silver Medals will be awarded to, nor can any entry as New Implements be accepted of, machines of any class for which competitive trials have been announced by the Society as about to take place.

8. The Judges of New Implements will commence their inspection at 2.30 P.M. on Monday, 20th June, and will take in rotation the Stands of the Exhibitors who have entered New Implements for the Society's Silver Medals. Each Exhibitor, or his representative, will be expected to be at the stand to explain the working of the Implement to the Judges. If the exhibit be not ready and in working order by the time the Judges make their inspection, it is liable to be struck off the list.

9. All publications by Exhibitors of the award of the Society's Silver Medals must state the year of the award, and must specify the exact nature of the "New Implement," of the improvement, or of the attachment to an Implement, for which the Silver Medal has been awarded.

10. On the recommendation of the Judges, with the approval of the Directors, any New Implement of merit, which cannot be sufficiently tried, or which is capable of further development, may be entered and exhibited as a "New Implement" at the succeeding Show of the Society.

11. The Judges' decision, when duly accepted and recorded, will in all cases be final.

RESERVED SEATS (NUMBERED) IN GRAND STAND.

For Charges and Tickets, apply to Secretary up to opening day of Show. Thereafter tickets are sold only in the Showyard at the Booking-offices behind the Grand Stand.

ADMISSION OF THE PUBLIC.

The public will be admitted daily at 8 A.M. Judging begins on Tuesday at 9.30 A.M. The charges for admission to the Yard will be —Tuesday, from 8 A.M. till 5 P.M., 5s. Wednesday, from 8 A.M. till 5 P.M., 5s.; from 5 P.M. to 8 P.M., 2s. Thursday, from 8 A.M. till 5 P.M., 2s. 6d.; from 5 P.M. till 8 P.M., 1s. Friday, from 8 A.M. till 5 P.M., 1s.

On Thursday and Friday children under twelve years of age admitted at 6d.

No Pass-out Checks given, and no re-admission without payment.

Season Tickets—12s. 6d. each (children under 12 years of age, 5s. each)—on application to Secretary. On the days of the Show, Season Tickets are sold only at the Entrance Gates.

ADMISSION OF MEMBERS AND EXHIBITORS.

On exhibiting their "*Member's Badge,*" which is strictly not transferable, Members of the Society are admitted free to the Showyard. Badges will be sent to all Members residing in Great Britain, Northern Ireland, and Eire (Irish Free State), whose addresses are known, and on no account will duplicates be issued. All Members not producing their badges must pay at the gates, and the admission money will not on any account be returned. Badges must be signed by Members before being presented at the gate, and Members should continue to wear the badge during the whole time that they are in the Showyard.

Tickets of admission to the Showyard are sent to Exhibitors of Stock, Poultry, Dairy Produce, &c. (not Members), whose Entry Fees amount to not less than 12s. 6d.

For Exhibitors of Implements and their assistants tickets are issued as provided in the Regulations for Implements.

VARIOUS.

Exhibitors may display their own Placards *inside and in front of* their stands; with this exception, no Bills of any kind other than those of the Society are permitted on any of the Show erections. No newspapers or any other articles to be carried about the Yard for sale or display.

No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath-chairs may be brought in.

Premium Lists, Regulations, and Certificates of Entry may be obtained by applying at the Secretary's Office, No. 8 Eglinton Crescent, Edinburgh 12.

All Communications should be addressed to the Secretary of the Highland and Agricultural Society of Scotland, No. 8 *Eglinton Crescent, Edinburgh* 12. *From* 14*th to* 23*rd June, to the Secretary's Office, Showyard, Dumfries.*

Address for Telegrams—" SOCIETY," EDINBURGH.

Telephone No.—EDINBURGH, 23655.

RAILWAY ARRANGEMENTS.

The Railway Companies will be furnished with a list of the Exhibitors of Stock and Implements, after the 1st June. All applications for horse-boxes and trucks, and for information as to train arrangements, must be made by the Exhibitors themselves to the Stationmaster where their stock is to be trucked.

The arrangements made by the Railway Companies for the conveyance of Live Stock and Goods to and from the Show are indicated *below, but Exhibitors are recommended to apply to the respective Companies for* full particulars :—

1. Live Stock, Agricultural Machines, Implements, and other exhibits *to* the Show to be charged ordinary rates.

2. Live Stock, Agricultural Machines, Implements, and other exhibits *from* the Show, if sold, to be charged ordinary rates.

3. Live Stock from the Show, if unsold, and returned not later than the second day after the closing day of the Show (excluding Sunday), to be carried at half rates back to the Station whence the animals were sent, at owner's risk, on surrender of a Certificate from the Exhibitor, provided in accordance with the Railway Companies' requirements, and signed by the Secretary, to the effect that they are really unsold; failing surrender of such Certificate, ordinary rates will be charged. The reduction to half rates is to be allowed only when the Stock are consigned to be returned by the same route as that by which they were conveyed to the Show, but it shall be in the option of the Railway Company or Companies to return the

Stock at half rates by a different route. Minimum charge for Stock returning at half rates to be one-half the ordinary minimum.

4. Live Poultry from the Show, *if unsold,* to be carried by Passenger Train at half rates back to the Station from which sent, at O.R., on surrender of an agreed Certificate signed by the Secretary of the Show to the effect that the Poultry are unsold and remain the property of the Exhibitor. No Certificate will be required for such traffic, which is intended by the owner to be returned from the Show to the original sending Stations by the same route as originally forwarded and the charges prepaid for both the outward and return journeys. (Poultry to be charged ordinary rates both ways when conveyed by Goods Train.)

Poultry are only charged at the half rate when returned by Passenger Train not later than the second day after the closing of the Show (Sunday being treated as a *dies non*).

5. Horse-boxes, or other Passenger Train vehicle, will not be provided for the carriage of Live Stock sent by Goods Train and invoiced at Goods Train rates. *For rates for Horse-boxes by Passenger and Special Trains, apply to the Railway Companies.*

6. Provender conveyed to and from Agricultural Shows in the same vehicle as Live Stock will be charged at the applicable rates, subject to a free weight allowance, viz.—

Cattle	per animal,	112 lb.
Horses	„	112 „
Sheep, goats, lambs, pigs, and calves .	„	56 „

7. The carriage of all Live Stock, Implements, and other articles going to the Show for exhibition must be PREPAID; and the carriage on all traffic *returned from the Show by Passenger Train Service must be PREPAID.*

The carriage charges on Live Stock conveyed in special vehicles by Passenger Train and intended to be returned to the original sending Station may also be prepaid for the return journey at the original sending Station if the owner so desires.

The Railway Charge on all exhibits which are conveyed by Passenger Train in the Guard's Van and intended to be returned from the Show direct to the original sending Station by the same route must be PREPAID, for both the outward and return journeys, at the original sending Station. The agreed form of address label for Poultry, Dairy Produce, Bee Appliances and Honey, and Rural Industries exhibits, which will be supplied through the Secretary of the Society, must be used in such cases.

8. Attendants in charge of Live Stock are conveyed free in the cases shown below, when certified by the owners to be *bona fide* in charge of such Live Stock:—

In Horse-Boxes.—Horses and Cattle: One man for each consignment, except where the consignment requires more than one vehicle, when one man to each vehicle may be sent free; but where two or three Horses or Cattle forming one consignment are sent in the same Horse-box and a man is required to travel with each animal, a man for each animal may be conveyed free, provided each animal is charged for separately.

In Horse-Boxes.—Small animals: One man to each vehicle.

In specially constructed Cattle Trucks.—Cattle or other animals: One man to each vehicle.

9. Agricultural Machines, Implements and other Exhibits from

the Show, *if unsold*, to be conveyed at half rates back to the Station whence they were sent, at Owner's risk, on production of a Certificate from the Exhibitor (provided and signed by the Show Secretary) to the effect that they are unsold; failing production of such Certificate, ordinary rates must be charged. The reduction to half rates is to be allowed only when the articles are returned by the same route as that by which they were conveyed to the Show, but it shall be in the option of the Railway Company or Companies to return the articles at half rates by a different route. This applies only to Goods Train Traffic.

10. Unsold articles, previously carried by railway, transferred from one Show to another, or exhibited at several Shows consecutively, and returned to the Station from whence originally sent, will be conveyed at half rates at Owner's risk, on production of a Certificate from the Exhibitor (provided and signed by the Show Secretary) to the effect that they are unsold; failing production of such Certificate, ordinary rates will be charged. This applies only to Goods Train Traffic.

11. Unsold Live Stock transferred from one Show to another will be charged ordinary rates.

12. The ordinary rates charged for carriage do not in any case include delivery *to*, or collection *from*, the Showground.

13. Agricultural Societies' Show Plant must be charged at Class 10 rates, Station to Station.

14. Tents, Canvas, Show Stands, and other articles not for exhibition—

(*a*) When the property of Exhibitors, to be charged half the ordinary rate at Owner's risk from Show to Show, and on return from the Show to the Station from whence originally despatched.

(*b*) When not the property of Exhibitors, to be charged the ordinary rates both going to and returning from Show.

15. Carriages and other Road Vehicles are only conveyed by Passenger Train when this can be conveniently done.

DELIVERY AND COLLECTION CHARGES.

Cartage Charges to be paid by the Exhibitor for the Delivery or Collection of traffic between the Railway Station at Dumfries and the Showground of the Highland and Agricultural Society's Show at Dumfries, on 21st, 22nd, 23rd, and 24th June.

*General traffic	5s. 9d. per ton.
*Machinery and Implements . .	5s. 9d. per ton.

* Minimum charge per consignment as for 5 cwt., unless the charge on actual weight at the Small Parcels Scale by Goods Train at the rate of 5s. 9d. per ton is lower.

Machines (hauled on their own wheels), and Hay Rakes, Cultivators, Distributors, Drills, Hay Makers, Horse Hay Rakes, Swath Turners, Trussers and other similar bulky articles, not exceeding one ton per article	5s. 9d. per ton.
Minimum charge	2s. 11d.

DELIVERY AND COLLECTION CHARGES—*continued.*

Single articles, exceeding 1 ton but not exceeding 3 tons . . .	8s. 5d. per ton.
Single articles, exceeding 3 tons but not exceeding 5 tons . . .	10s. per ton.
Single articles, exceeding 5 tons, by special arrangement only, but no less charge than	12s. 4d. per ton.
Railway containers (net weight of contents)	8s. 5d. per ton.
Minimum charge	8s. 5d.
Loaded vans on their own wheels exceeding 1 ton but not exceeding 3	8s. 5d. per ton.
Loaded vans on their own wheels exceeding 3 tons but not exceeding 5	10s. per ton.
Loaded vans on their own wheels exceeding 5 tons, by special arrangement only, but no less charge than	12s. 4d. per ton.
Rustic Houses, by special arrangement only, but no less charge than .	14s. 8d. per load.
Carriages, on their own wheels . .	6s. 4d. each.
Carriages, if carried on a Railway Company's lorry	7s. 11d. per ton.
Minimum charge per consignment .	7s. 11d.
Cattle, in floats	5s. 3d. per head.
Minimum charge for each float .	7s. 11d.
Sheep, Goats, and Pigs, in floats .	1s. 7d. per head.
Minimum charge for each float .	7s. 11d.
Pigs, in crates	3s. 5d. per crate.
Minimum charge per load . .	6s. 10d.
Ordinary Parcels by passenger train .	7d. each.
Miscellaneous passenger train traffic, including packages of plants and flowers carried at O.R. rates S. to S.	10d. per cwt.
Minimum charge per consignment .	1s. 7d.
†Poultry, in crates or hampers . .	10d. per crate or hamper.
Cartage from point to point inside the Showground	3s. 2d. per hour.
Minimum charge	3s. 2d.

† **Poultry exhibits only** will be conveyed at the Society's expense from the Railway Station to the Showyard and back, but no exhibit subject to railway charges will be received by the Society. All other delivery charges must be paid by the Exhibitor.

THE PRESIDENT'S CHAMPION MEDALS

To commemorate the Presidency of H.R.H. The Duke of Gloucester, K.G., K.T., the Society offers a Champion Silver Medal for the best *Animal* in each of the following sections:—

1. Shorthorn
2. Aberdeen-Angus
3. Galloway.
4. Belted Galloway
5. Highland.
6. Ayrshire.
7. British Friesian
8. Clydesdale Stallion or Colt
9. Clydesdale Gelding.
10. Clydesdale Mare or Filly
11. Hunter.
12. Highland or Western Island Pony
13. Shetland Pony.
14. Hackney in Harness
15. Blackface Sheep
16. Cheviot.
17. Border Leicester
18. Half-Bred.
19. Oxford Down.
20. Suffolk
21. Goat.
22. Large White Pig.
23. Large Black.
24. Essex

NOTE.—*Animals entered as Extra Stock may compete for these Medals. Former Winners of the President's Medals are eligible. The Society shall have the right to photograph the Winners for publication in the 'Transactions.' At this Show no animal can be awarded more than one of these Medals.*

*CATTLE

(To be judged at 9.30 A.M. on Tuesday, 21st June)

SHORTHORN

Judges: J D Key, R. K Wright

President's Champion Medal for best Shorthorn Animal

ENTRY FEES		*CLASS*		*PREMIUMS*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
25/-	45/-	1	Bull born before 1st December 1935.	15	10	5	3
25/-	45/-	2	Bull born on or after 1st December 1935 and before 1st December 1936	15	10	5	3
25/-	45/-	3	Bull born on or after 1st December 1936 and before 1st April 1937	12	8	4	2
25/-	45/-	4	Bull born on or after 1st April 1937.	10	6	4	2
25/-	45/-	5	Cow in Milk, born before 1st December 1934	12	8	4	2
25/-	45/-	6	Cow in Milk, born on or after 1st December 1934 and before 1st December 1935	10	5	3	2
25/-	45/-	7	Cow or Heifer born on or after 1st December 1935 and before 1st December 1936	10	5	3	2
25/-	45/-	8	Heifer born on or after 1st December 1936 and before 1st April 1937	10	5	3	2
25/-	45/-	9	Heifer born on or after 1st April 1937	10	5	3	2

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* See Rules 32 and 33.

CATTLE

SHORTHORN—*continued*

ENTRY FEES		CLASS		*PREMIUMS*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
			[1] **The Duthie Perpetual Challenge Cup**, value £150, for best Animal in the Shorthorn Classes, "Extra Stock" eligible to compete.				
			[2] **Silver Cup**, value £50, for the best Group of three animals in the Shorthorn Classes, consisting of one Bull and two Females, "Extra Stock" eligible to compete. The Cup to become the property of an Exhibitor who shall win it three times, not necessarily in succession.				
			[3] **Tweeddale Gold Medal**, value about £25, for best Shorthorn Bull, "Extra Stock" eligible to compete.				
			[4] **The Emilio R. Casares, jun., "Junior Memorial Champion Cup,"** value 50 guineas, for best Shorthorn Bull in Class 4, calved on or after 1st April of the year preceding the year of the Show, that has passed the tuberculin test.				
			[5] **Best Shorthorn Bull in the Show**, entered or eligible for entry in Coates's Herd-Book—£20.				
			[5] **Silver Medal** to the Breeder of the winner of above Prize.				
			Breeder of best Bull of any age in the four Classes ("Extra Stock" not eligible to compete)—The Silver Medal.				
			[5] **Best Shorthorn Female in the Show**, entered or eligible for entry in Coates's Herd-Book—£20.				
			[5] **Silver Medal** to the Breeder of the winner of above Prize.				
			PRIZE MONEY BY SOCIETY . . £220				
			CONTRIBUTED . . . 40				

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[1] This Cup was gifted by the late Mr William Duthie, Collynie. The Cup may not be won on more than one occasion with the same animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica as a memento of his winning the Cup.

[2] Given by Mr William M'Nair Snadden, The Coldoch, Blair Drummond, Stirling.

[3] Annual Free Income from Fund of £500.

[4] Given by Messrs J. Baird & Co. (Falkirk) Ltd., Bantaskin, Falkirk. This Cup will become the property of the Exhibitor who shall win it three times, not necessarily in succession.

[5] Given by the Shorthorn Society.

CATTLE

ABERDEEN-ANGUS

Judges : W. G. Macpherson ; James L. Whyte

President's Champion Medal for best Aberdeen-Angus Animal

Entry Fees		*Class*		*Premiums*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
25/-	45/-	10	**Bull** born before 1st December 1935 . . .	15	10	5	3
25/-	45/-	11	**Bull** born on or after 1st December 1935 and before 1st December 1936	15	10	5	3
25/-	45/-	12	**Bull** born on or after 1st December 1936 and before 1st March 1937	12	8	4	2
25/-	45/-	13	**Bull** born on or after 1st March 1937 . .	10	6	4	2
25/-	45/-	14	**Cow** in Milk, born before 1st December 1934 .	12	8	4	2
25/-	45/-	15	**Cow** in Milk, born on or after 1st December 1934 and before 1st December 1935	12	8	4	2
25/-	45/-	16	**Cow** or **Heifer** born on or after 1st December 1935 and before 1st December 1936	10	5	3	2
25/-	45/-	17	**Heifer** born on or after 1st December 1936 and before 1st March 1937	10	5	3	2
25/-	45/-	18	**Heifer** born on or after 1st March 1937 . .	10	5	3	2

[1] **Silver Cup**, value £50, for best Group of Aberdeen-Angus Cattle, consisting of one Bull and two Females, "Extra Stock" not eligible to compete. The Cup to become the property of an Exhibitor who shall win it three times, not necessarily in succession.

[2] **Silver Cup**, value 50 guineas, for best Aberdeen-Angus Bull born on or after 1st December 1935, to become the property of an Exhibitor who shall win it three times, not necessarily in succession.

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[1] Given by Mr J. E. Kerr of Harviestoun, Dollar. A Silver Medal will be given by the Society to the winner as a memento of his winning the Cup.

[2] Given by Senor Eduardo Estanguet, Argentina.

ENTRY FEES		*CLASS*	CATTLE	*PREMIUMS*			
Members	*Non-Members*		**ABERDEEN-ANGUS**—*continued*	*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
			Breeder of best Bull of any age in the four Classes (" Extra Stock " not eligible to compete)—The Silver Medal.				
			[1] **Ballindalloch Challenge Cup,** value £50, for the best Bull of any age in the four Classes.				
			Exhibitor of the Winner of the Ballindalloch Challenge Cup—The Silver Medal				
			Breeder (if not also the Exhibitor) **of the Winner** of the Ballindalloch Challenge Cup—The Silver Medal.				
			[2] **Harviestoun Challenge Cup,** value £50, for the best Cow of any age in Classes 14, 15, and 16.				
			Exhibitor of the Winner of the Harviestoun Challenge Cup—The Silver Medal.				
			Breeder (if not also the Exhibitor) **of the Winner** of the Harviestoun Challenge Cup—The Silver Medal.				
			[3] **Silver Cup,** value £50, for the best Female Animal of the Aberdeen-Angus breed, to become the property of an Exhibitor who shall win it four times, not necessarily in succession. " Extra Stock " eligible to compete.				
			[4] **Champion Gold Medal, value £10, for best Animal in the Breeding Classes, breeding animals shown as " Extra Stock " eligible to compete.**				
			PRIZE MONEY BY SOCIETY . £226				

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[1] "The Ballindalloch Challenge Cup," value £50, is offered for the best Bull of any age in the Aberdeen-Angus Classes. This Cup was presented by the late Sir George Macpherson Grant, Bart. The Cup will become the property of the Exhibitor who shall win it five times, not necessarily in succession. The Exhibitor and Breeder of the successful animal each year will receive the Society's Silver Medal, with suitable inscription.

[2] "The Harviestoun Challenge Cup," value £50, for the best Cow of any age (Heifers excluded), was presented by Mr J. E. Kerr of Harviestoun, Dollar. The Cup will become the property of the Exhibitor who shall win it five times, not necessarily in succession. The Exhibitor and Breeder of the successful animal each year will receive the Society's Silver Medal, with suitable inscription.

[3] Presented by Mr Falconer L. Wallace of Candacraig, Strathdon. A Silver Medal will be given by the Society to the winner as a memento of his winning the Cup.

[4] Given by The Aberdeen-Angus Cattle Society.

CATTLE

GALLOWAY

Judge: James Clark

President's Champion Medal for best Galloway Animal

Entry Fees Members	*Entry Fees* Non-Members	*Class*		*Premiums* First £	Second £	Third £	Fourth £
25/-	45/-	19	**Bull** born before 1st December 1935	15	10	5	3
25/-	45/-	20	**Bull** born on or after 1st December 1935 and before 1st December 1936	15	10	5	3
25/-	45/-	21	**Bull** born on or after 1st December 1936	12	8	4	2
25/-	45/-	22	**Cow** in milk, born before 1st December 1935	12	8	4	2
25/-	45/-	23	**Cow** or **Heifer** born on or after 1st December 1935 and before 1st December 1936	10	5	3	2
25/-	45/-	24	**Heifer** born on or after 1st December 1936 and before 1st March 1937	10	5	3	2
25/-	45/-	25	**Heifer** born on or after 1st March 1937	10	5	3	2

[1] **Renfrewshire Perpetual Gold Challenge Cup,** value £250, for best Galloway Animal, "Extra Stock" eligible to compete.

[2] **Dr Gillespie Memorial Challenge Trophy,** value £50, for best Galloway Animal in the Breeding Classes, breeding animals shown as "Extra Stock" eligible to compete—see conditions below

[3] **Silver Challenge Cup,** value £50, for best animal of the sex opposite to that of the winner of the Dr Gillespie Memorial Challenge Trophy, "Extra Stock" eligible to compete.

Breeder of best Bull of any age in the three Classes ("Extra Stock" not eligible to compete) —The Silver Medal.

PRIZE MONEY BY SOCIETY £178

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[1] This Cup, along with an endowment of £500, was provided from money collected in Renfrewshire by the late Provost Muir M'Kean of Paisley, and is in commemoration of the Society's first Show in the county of Renfrew in 1913. This year the Cup is offered for the best Galloway Animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

[2] This Trophy was presented by the Galloway Cattle Society of Great Britain and Ireland for the best Galloway animal registered in the Galloway Cattle Society's Herd-Book, entered in any of the breeding classes, at the Show at which it may be competed for. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive the Galloway Cattle Society's Silver Medal as a memento of his winning the Trophy.

[3] This Cup was presented by the Galloway Cattle Society to commemorate the Hundredth Show of the Highland and Agricultural Society, to be awarded to best animal of the sex opposite to that of the winner of the Dr Gillespie Memorial Trophy registered in the Galloway Cattle Society's Herd-Book. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so.

ENTRY FEES		*CLASS*		*PREMIUMS*			
Members	*Non-Members*		**CATTLE**	*First*	*Second*	*Third*	*Fourth*
			BELTED GALLOWAY	£	£	£	£
			Judge: John Drynan				
			President's Champion Medal for best Belted Galloway Animal				
25/-	45/-	26	**Bull** born before 1st December 1936 . .	10	5	3	2
25/-	45/-	27	**Bull** born on or after 1st December 1936 . .	10	5	3	2
25/-	45/-	28	**Cow or Heifer** born before 1st December 1935, in Milk or in Calf; if in calf and not in milk, to calve on or before 1st December of the year of the Show	10	5	3	2
25/-	45/-	29	**Heifer** born on or after 1st December 1935 and before 1st December 1936	10	5	3	2
25/-	45/-	30	**Heifer** born on or after 1st December 1936 . .	10	5	3	2

[1] **Knockbrex Challenge Cup,** value £50, for the best Belted Galloway Animal, "Extra Stock" eligible to compete.

[2] **The Ian Hamilton Silver Challenge Cup,** value £50, for the best Belted Galloway Animal of the sex opposite to that of the winner of the Knockbrex Challenge Cup, "Extra Stock" eligible to compete. The winning animal to be registered or eligible for registration in the Dun and Belted Galloway Herd-Book.

Breeder of best Bull in Classes 26 and 27 ("Extra Stock" not eligible to compete)—The Silver Medal.

PRIZE MONEY BY SOCIETY . . £100

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[1] This Cup was presented by Mrs Brown, Kirkbrex, Glasgow, for the best Belted Galloway animal registered in the Dun and Belted Galloway Cattle Breeders' Association Herd-Book, entered in any of the breeding classes, at the Show at which it may be competed for. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive a Silver Medal as a memento of his winning the Trophy.

[2] This Cup was presented by General Sir Ian Hamilton, G.C.B. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so.

CATTLE

HIGHLAND

Judge John M Macdonald

President's Champion Medal for best Highland Animal

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £	PREMIUMS Fourth £
25/-	45/-	31	**Bull** born before 1st December 1935	15	10	5	3
25/-	45/-	32	**Bull** born on or after 1st December 1935 and before 1st December 1936	15	10	5	3
25/-	45/-	33	**Bull** born on or after 1st December 1936	12	8	4	2
25/-	45/-	34	**Cow** of any age with Calf at foot	12	8	4	2
25/-	45/-	35	**Heifer** born on or after 1st December 1934 and before 1st December 1935	10	5	3	2
25/-	45/-	36	**Heifer** born on or after 1st December 1935 and before 1st December 1936	10	5	3	2
25/-	45/-	37	**Heifer** born on or after 1st December 1936	10	5	3	2

[1] **Perpetual Victory Challenge Cup, approximate value 50 Guineas, for the best Animal in the Male Classes, "Extra Stock" eligible to compete.**

Breeder of best Bull in Classes 31, 32, and 33 ("Extra Stock" not eligible to compete)—The Silver Medal.

[1] **Perpetual Victory Challenge Cup, approximate value 35 Guineas, for the best Animal in the Female Classes, "Extra Stock" eligible to compete.**

PRIZE MONEY BY SOCIETY . . £178

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[1] Given by the Highland Cattle Society of Scotland.

CATTLE

AYRSHIRE

Judges: George Templeton; James Wallace

1. To be eligible for competition in the Ayrshire Section Cows must have an authenticated Milk Yield, and younger Females (including Cows which have not completed their first lactation) and Bulls an authenticated Milking Pedigree, of a definite minimum amount.

2. The minimum amount referred to shall be as follows, calculated on the basis of a period between calvings of 52 weeks, and 3·8 per cent of butter fat:—

(*a*) Cows which have completed two or more lactations—700 gallons.

(*b*) Cows which have completed only one lactation—600 gallons.

(*c*) Younger Females and Bulls—an authenticated Milking Pedigree for dam and dam of sire on a similar basis.

3. In the case of Cows with two or more lactations the record lodged may be that for any year the Exhibitor may select.

4. In the case of a Cow which has no milking pedigree, and which has not completed her first lactation at date of entry, but is likely to calve again before date of Show, such Cow may be provisionally entered on her own milk yield produced within forty weeks after first calving, but when the Cow has calved again a further Certificate in terms of the Rules must be obtained and produced before the Cow is allowed to enter the judging ring. The latter Certificate is the standard of qualification, and failure to produce such will render the Cow liable to disqualification, and no entry money will be returned.

5. The evidence of Milk Yield and Milking Pedigree shall be in the form of a Certificate signed by the Secretary of the Scottish Milk Records Association. The Certificate, besides giving the actual yields, shall give these calculated on a uniform basis of a period of 52 weeks between calvings, and 3·8 per cent butter fat. This latter figure shall be communicated to the Judge before adjudicating.

In the case of an Exhibitor founding on the Milk Yield of any animal, or animals, made in England, said Exhibitor must forward a Certificate of Milk Yield from the Secretary of the County Milk Recording Society in which the Exhibitor resides, together with a Certificate from a competent analyst, stating that a butter-fat test had been made at least once every 28 days during the period of lactation, and with details of said butter-fat tests attached, to the Secretary of the Scottish Milk Records Association, who has undertaken to check the records and to certify same.

6. The authenticated Milk Yields and authenticated Milking Pedigrees shall appear in the Catalogue.

N.B.—**Certificates above referred to must be obtained from Mr John Howie, 58 Alloway Street, Ayr, and lodged with Entries.**

President's Champion Medal for best Ayrshire Animal

Entry Fees: Members	Entry Fees: Non-Members	Class		Premiums: First £	Second £	Third £	Fourth £
25/-	45/-	38	[1] Cow in Milk,* born before 1935	12	8	4	2
25/-	45/-	39	[1] Cow in Milk,* born on or after 1st January 1935 .	10	7	3	2
25/-	45/-	40	[1] Cow of any age in Calf,* and due to calve before 1st December of the year of the Show . .	10	7	3	2
25/-	45/-	41	Heifer * born on or after 1st June 1935, in Calf and due to calve before 1st December of the year of the Show	10	7	3	2
25/-	45/-	42	Heifer * born in 1936	10	5	3	2
25/-	45/-	43	Heifer born in 1937	8	5	3	2

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* See Rules 33, 42, and 72.

[1] Cows in these Classes must have produced a calf within fifteen months prior to the Show.

CATTLE

AYRSHIRE—*continued*

ENTRY FEES		*CLASS*		*PREMIUMS*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
25/-	45/-	44	Bull born before 1936	12	8	4	2
25/-	45/-	45	Bull born in 1936	10	7	3	2
25/-	45/-	46	Bull born in 1937	8	5	3	2

[1] **Edinburgh Corporation Perpetual Gold Challenge Cup** for best Ayrshire animal. "Extra Stock" eligible to compete.

[2] **Cowhill Champion Cup,** approximate value £30, for best Animal of the Ayrshire breed, entered with a number in the Herd-Book. The Cup to be won three times, not necessarily in succession, by the same person with different animals, before becoming the property of the winner. No animal which has already won the Cup shall be eligible to compete.

[3] **Special Prize of £10** for the best Female Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book prior to 1st June 1938. "Extra Stock" eligible to compete.

Breeder of best Bull of any age in Classes 44, 45, and 46 ("Extra Stock" not eligible to compete)—The Silver Medal.

[3] **Special Prize of £10** for the best Male Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book prior to 1st June 1938. "Extra Stock" eligible to compete.

PRIZE MONEY BY SOCIETY	£196
CONTRIBUTED	20

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[1] This Cup was presented by the City of Edinburgh to commemorate the Society's Hundredth Show. This year the Cup is offered for best Ayrshire animal. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so.

[2] Presented by the late Major Henry Keswick, Cowhill Tower, Dumfries, to the Ayrshire Cattle Herd-Book Society, to be competed for annually at the Shows of the Highland and Agricultural Society of Scotland. Messrs James Howie & Sons, Muirside, Dumfries, who won this Cup outright in 1934, have kindly re-presented the Cup to the Society for competition on the same conditions as formerly.

[3] Given by the Ayrshire Cattle Herd-Book Society.

CATTLE

BRITISH FRIESIAN

Judges: John E. Moffitt; Alexander Wilson

President's Champion Medal for best British Friesian Animal

ENTRY FEES		*CLASS*		*PREMIUMS*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
25/-	45/-	47	[1] Cow in Milk,* born in or before 1934	12	8	4	2
25/-	45/-	48	[1] Cow in Calf,* and not in Milk, born in or before 1934	10	5	3	2
25/-	45/-	49	[1] Cow in Milk,* born in 1935 or 1936	10	5	3	2
25/-	45/-	50	Heifer * born in 1936	10	5	3	2
25/-	45/-	51	Heifer born in 1937, before 1st July	10	5	3	2
25/-	45/-	52	Heifer born in 1937, on or after 1st July	10	5	3	2
25/-	45/-	53	Bull born in or before 1935	12	8	4	2
25/-	45/-	54	Bull born in 1936	10	5	3	2
25/-	45/-	55	Bull born in 1937	10	5	3	2

[2] **The MacRobert Champion Silver Bell,** value 50 Guineas, for the best Animal in the British Friesian Classes, registered in or eligible for entry in the British Friesian Cattle Society's Herd-Book. "Extra Stock" eligible to compete.

[3] **Silver Challenge Cup,** value 50 guineas, for the best Group of three animals. The Cup to become the property of an Exhibitor winning it three times, not necessarily in succession. "Extra Stock" eligible to compete.

Champion Prize of £5 given by the British Friesian Cattle Society for the best Female Animal exhibited. "Extra Stock" eligible to compete.

Breeder of Best Bull of any age in Classes 53, 54, and 55 ("Extra Stock" not eligible to compete)—The Silver Medal.

Champion Prize of £5 given by the British Friesian Cattle Society for the best Male Animal exhibited. "Extra Stock" eligible to compete.

PRIZE MONEY BY SOCIETY	£152
[3] CONTRIBUTED	50

PRIZE MONEY BY SOCIETY	£1250	0
CONTRIBUTED	110	0
CUPS, MEDALS, &c.	1314	5
Total Prizes for Cattle	£2674	5

[See Note as to **EXTRA STOCK**, p. 129.]

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* See Rules 33, 42, and 72.

[1] Cows in these Classes must have produced a calf within fifteen months prior to the Show.

[2] Presented by Lady Rachel Workman MacRobert, Douneside, Tarland. This Bell will become the property of the Exhibitor who shall win it three times, not necessarily in succession. The winner of the Bell on each occasion will receive a miniature replica in silver as a memento of winning the Bell. The Breeder of the winning animal will also receive a replica, provided he or she is not also the Exhibitor.

[3] Given by the British Friesian Cattle Society.

*HORSES

CLYDESDALE

Judges: Walter A. Aitkenhead; John Kerr; Robert Mackay; Andrew Somerville

STALLION AND COLT

(*To be judged at* 9.30 A.M. *on Tuesday*, 21*st June*)

President's Champion Medal for best Clydesdale Stallion or Colt

Entry Fees		Class		Premiums			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
55/-	75/-	56	**Stallion born before 1935**	20	15	10	4
55/-	75/-	57	**Entire Colt born in 1935**	20	15	10	4
55/-	75/-	58	**Entire Colt born in 1936**	20	15	10	4
40/-	60/-	59	**Entire Colt born in 1937**	15	9	6	4

[1] **Cawdor Challenge Cup**, value 50 Guineas, for best Clydesdale Stallion or Colt, "Extra Stock" eligible to compete.

Breeder of best Male Animal of any age in the above Classes ("Extra Stock" not eligible to compete)—The Silver Medal.

[2] **William Taylor Memorial Prize of £10 and Certificate** to the Breeder of the best Clydesdale Colt entered in Classes 58 and 59.

PRIZE MONEY BY SOCIETY	£181
CONTRIBUTED PRIZE	10

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* **For prizes given by the Society, no animal is allowed to enter in more than one Class, except that horses entered in other Classes may also compete in the Jumping and Hackney in Harness Classes.**

[1] This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland (subject to the conditions of that Society) for the best Clydesdale Stallion or Colt registered in the Clydesdale Stud-Book, entered in any of the Clydesdale Horse Classes, at the Show at which it may be competed for. No Stallion rising five years old or upwards will be allowed to compete for this Cup unless proof be furnished to satisfy a Committee, appointed for this purpose by the Council of the Clydesdale Horse Society, that he has during the preceding season left at least 35 per cent of the mares served by him in foal. The Cup must be won four times by an Exhibitor with different animals (but not necessarily in consecutive years) before it becomes his absolute property. No animal which has won a Cawdor Cup shall be eligible to compete. The animal winning this Cup must be certified free from hereditary disease. The winner of the Cup, other than the absolute winner, shall, before delivery thereof is made to him, give security to the Clydesdale Horse Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. Until the Cup be won outright, the winner on each occasion will receive the Clydesdale Horse Society's Silver Medal as a memento of his winning the Cup.

[2] Given by William Taylor Memorial Committee.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

HORSES

CLYDESDALE—*continued*

GELDING

Got by a Registered Clydesdale Stallion

(*To be judged at 3 P.M. on Tuesday, 21st June*)

President's Champion Medal for best Clydesdale Gelding

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	Second £	Third £	Fourth £
40/-	60/-	60	**Gelding** born before 1935	15	9	6	4
40/-	60/-	61	**Gelding** born in 1935	15	9	6	4
40/-	60/-	62	**Gelding** born in 1936	15	9	6	4

[1] **The James Clark Silver Challenge Cup**, value 50 guineas, for best Clydesdale Gelding, to become the property of an Exhibitor who shall win it four times with different animals, but not necessarily in succession. "Extra Stock" eligible to compete. No animal which has already won the Cup is eligible to compete.

PRIZE MONEY BY SOCIETY . . £102

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[1] Given by Mr James Clark, Windlaw Farm, Carmunnock.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

HORSES

CLYDESDALE—*continued*

MARE AND FILLY

(To be judged at 9.30 A.M. on Tuesday, 21st June)

President's Champion Medal for best Clydesdale Mare or Filly

ENTRY FEES		CLASS		PREMIUMS			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
55/-	75/-	63	**Mare** of any age, with Foal at foot, or due to foal before 31st July 1938	20	12	7	4
40/-	60/	64	**Yeld Mare** born before 1935	15	9	6	4
40/-	60/	65	**Yeld Mare or Filly** born in 1935	15	9	6	4
40/-	60/-	66	**Filly** born in 1936	15	9	6	4
40/-	60/	67	**Filly** born in 1937	15	9	6	4

[1] **Paisley Perpetual Gold Challenge Cup,** value £300, for best Clydesdale Mare or Filly, "Extra Stock" eligible to compete.

[2] **Cawdor Challenge Cup,** value 50 Guineas, for best Clydesdale Mare or Filly, "Extra Stock" eligible to compete.

PRIZE MONEY BY SOCIETY . . £179

Total Prize Money for Clydesdale Horses, £472

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[1] This Cup, along with an endowment of £600, was provided from money collected in Paisley by the late Provost Muir M'Kean, and is in commemoration of the Society's first Show at Paisley in 1913. This year the Cup is offered for the best Clydesdale Mare or Filly. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

[2] This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland (subject to the conditions of that Society) for the best Clydesdale Mare or Filly registered in the Clydesdale Stud-Book, entered in any of the Clydesdale Horse Classes, at the Show at which it may be competed for. The Cup must be won four times by an Exhibitor with different animals (but not necessarily in consecutive years) before it becomes his absolute property. No animal which has won a Cawdor Cup shall be eligible to compete. The animal winning this Cup must be certified free from hereditary disease. The winner of the Cup, other than the absolute winner, shall, before delivery thereof is made to him, give security to the Clydesdale Horse Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. Until the Cup be won outright, the winner on each occasion will receive the Clydesdale Horse Society's Silver Medal as a memento of his winning the Cup.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

ENTRY FEES		*CLASS*	HORSES	*PREMIUMS*		
Members	*Non-Members*			*First*	*Second*	*Third*
			HUNTER			
			Judges: Major J. Orr-Ewing, M.C. (Classes 68 to 75); Major E. W. Hope Johnstone (Classes 76 to 79)			
			(*Classes* 68 *to* 75 *to be judged at* 11 A.M. *on Tuesday,* 21*st June*)	£	£	£
			President's Champion Medal for best Hunter (*Classes* 68 *to* 78)			
55/-	75/-	68	**Hunter Brood Mare,** with Foal at foot, or due to foal before 31st July 1938.	15	7	3
5/-	5/-	69	**Foal,** drawn from Class 68	7	4	2
40/-	60/-	70	**Gelding** born in 1935—*in hand*	10	5	3
40/-	60/-	71	**Filly** born in 1935—*in hand*.	10	5	3
40/-	60/-	72	**Gelding** born in 1936—*in hand*	10	5	3
40/-	60/-	73	**Filly** born in 1936—*in hand*	10	5	3
40/-	60/-	74	**Colt or Gelding** born in 1937—*in hand* . .	10	5	3
40/-	60/-	75	**Filly** born in 1937—*in hand*	10	5	3
			[If there are less than three entries in any of the Classes 70 to 75, the Geldings or Colts and Fillies of the same age will be judged as one Class.]			
			(*Classes* 76 *to* 79 *to be judged at* 2.30 P.M. *on Tuesday,* 21*st June*)			
40/-	60/-	76	**Mare or Gelding** born before 1934, to carry 14 stone and over—*in saddle*	15	10	5
40/-	60/-	77	**Mare or Gelding** born before 1934, to carry under 14 stone—*in saddle*	15	10	5
40/-	60/-	78	**Mare or Gelding** born in 1934—*in saddle* . .	15	10	5
40/-	60/-	79	**Hack of Hunter Type,** born in or before 1934, not exceeding 15.2 hands—*in saddle* . . .	8	5	3
			[1] **Dumfries Centenary Silver Challenge Cup,** value £100, for best Hunter. The Cup to become the property of an Exhibitor who shall win it three times, not necessarily in succession, at Shows at which there are not less than three Saddle Classes. "Extra Stock" not eligible to compete.			
			[2] **Dundee Citizens' Perpetual Silver Challenge Cup,** value about £50, for the best Hunter, "Extra Stock" eligible to compete.			
			[3] **Best Hunter Filly,** entered in Classes 71 73, and 75, registered with a number in the Hunter Stud-Book, or the entry tendered within one month of the award—Champion Gold Medal, value £5.			
			PRIZE MONEY BY SOCIETY **£252**			

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[1] Presented by Members of the Dumfriesshire Hunt in 1930 to commemorate the centenary of the Highland Society's first Show at Dumfries in 1830.

[2] This Cup was presented by the Citizens of Dundee to commemorate the holding of the Society's Annual Show at Dundee in 1933. On this occasion the Cup is offered for the best Hunter. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive a Medal as a memento of his winning the Trophy.

[3] Given by the Hunters' Improvement and National Light Horse Breeding Society.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 38.

ENTRY FEES		*CLASS*		*PREMIUMS*			
Members	*Non-Members*		**HORSES**	*First*	*Second*	*Third*	*Fourth*
			RIDING PONIES	£	£	£	£
			Judge: Major E. W. Hope Johnstone				
			(*To be judged at* 10.15 A.M. *on Wednesday,* 22*nd June*)				
5/-	5/-	80	**Mare or Gelding,** any age, over 13.2 hands and not exceeding 14.2 hands—*in saddle*	5	3	2	–
5/-	5/-	81	**Mare or Gelding,** any age, over 12 hands and not exceeding 13.2 hands—*in saddle*—to be ridden by boy or girl not exceeding 14 years of age .	5	3	2	–
5/-	5/-	82	**Mare or Gelding,** any age, not exceeding 12 hands —*in saddle*—to be ridden by boy or girl not exceeding 12 years of age	5	3	2	–
			PRIZE MONEY BY SOCIETY . . £30				
			[Ponies in the above Classes to be exhibited on Wednesday only. They must be in the Showyard not later than 9 A.M. on Wednesday and may leave immediately after the afternoon Parade. **Boxes are not provided for these ponies.**]				
			HILL PONIES				
			Judge: Major E. W. Hope Johnstone				
			(*To be judged at* 11 *a.m. on Wednesday,* 22*nd June*)				
40/-	60/-	83	**Hill Pony (Highland, Fell or Dales),** any age, to be shown in saddle	8	5	3	2
			PRIZE MONEY BY SOCIETY . . £18				

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 38.

HORSES

*[1] HIGHLAND and WESTERN ISLAND PONIES

Judge: Colin Campbell

(To be judged at 2 P.M. on Tuesday, 21st June)

President's Champion Medal for best Highland or Western Island Pony

ENTRY FEES		*CLASS*		*PREMIUMS*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
40/-	60/-	84	**Stallion** born before 1936, not exceeding 14.2 hands	8	5	3	2
40/-	60/-	85	**Entire Colt** born on or after 1st January 1936, not exceeding 14.2 hands	8	5	3	2
40/-	60/-	86	**Mare**, any age, not exceeding 14.2 hands, with Foal at foot, or due to foal before 31st July 1938 .	8	5	3	2
40/-	60/-	87	**Yeld Mare or Filly** born before 1936, not exceeding 14.2 hands	8	5	3	2
40/-	60/-	88	**Filly** born on or after 1st January 1936, not exceeding 14.2 hands	8	5	3	2

[2] **Kinmonth Perpetual Gold Challenge Quaich** for best Highland or Western Island Pony. An animal winning the Quaich will become ineligible again to compete.

[3] **Special Prize of £8** given by Highland Pony Society for best Male Animal not exceeding 14.2 hands, entered in Classes 84 and 85. "Extra Stock" not eligible to compete.

[3] **Special Prize of £8** given by Highland Pony Society for best Female Animal not exceeding 14.2 hands, entered in Classes 86, 87, and 88. "Extra Stock" not eligible to compete.

PRIZE MONEY BY SOCIETY . .	£50
CONTRIBUTED PRIZES . .	56

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* See Rule 28.

[1] The Department of Agriculture for Scotland gives £40 towards prizes for Highland and Western Island Ponies.

[2] This Quaich—along with a sum of money to provide a miniature replica in silver annually—was presented by Mrs Moncrieff Wright, Kinmonth, Bridge of Earn, in memory of her husband, the late John Moncrieff Wright of Kinmonth. The winner of the Quaich shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Quaich on each occasion will receive a miniature replica in silver as a memento of his, or her, winning the Quaich. An Exhibitor who shall win the Quaich five times, not necessarily in succession, will receive in lieu of a miniature a full-size replica in silver.

[3] The animals winning these Prizes must be entered or accepted for entry in the Highland Section of the National Pony Stud-Book. Competition to be strictly confined to animals passed sound and free from hereditary disease.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

HORSES

SHETLAND PONIES

Judge P F Manson

(To be judged at 2.30 P.M. on Tuesday, 21st June)

(All to be shown in hand)

President's Champion Medal for best Shetland Pony

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	Second £	Third £	Fourth £
35/-	55/-	89	**Stallion**, not exceeding 10½ hands, born before 1935	8	5	3	2
35/-	55/	90	**Entire Colt**, not exceeding 10½ hands, born in 1935 or 1936 . . .	8	5	3	2
35/-	55/	91	**Mare**, not exceeding 10½ hands, with Foal at foot, or due to foal before 31st July 1938 .	8	5	3	2
35/-	55/-	92	**Yeld Mare**, not exceeding 10½ hands . .	8	5	3	2
35/-	55/-	93	**Filly**, not exceeding 10½ hands, born in 1935 or 1936	8	5	3	2

[1] **Perpetual Silver Challenge Cup**, value £50, for best Group of Shetland Ponies drawn from the ordinary Classes, consisting of one male and two females "Extra Stock" eligible to compete.

[2] **Silver Medal** for the best Shetland Pony of the sex opposite to that of the winner of the President's Medal, entered or eligible for entry in the Shetland Pony Stud-Book.

PRIZE MONEY BY SOCIETY . . **£90**

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[1] Presented by a few members of the Shetland Pony Stud Book Society The winner on each occasion will receive a Shetland Pony Stud Book Society's Miniature Silver Medal as a memento of winning the Cup.

[2] Given by the Shetland Pony Stud-Book Society.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

HORSES

[1]HACKNEYS IN HARNESS

Judge: Captain R. M'Lean

(*To be judged at* 11.30 A.M. *on Wednesday, 22nd June*)

[2]***President's Champion Medal for best Animal in the Classes for Hackneys in Harness***

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £	PREMIUMS Fourth £
40/-	60/-	94	**Stallion, Mare, Filly, or Gelding,** any age, in Harness, exceeding 15 hands, to be driven in the ring	15	10	5	–
40/-	60/-	95	**Stallion, Mare, Filly, or Gelding,** any age, in Harness, over 14 hands and not exceeding 15 hands, to be driven in the ring . . .	15	10	5	–
40/-	60/-	96	**Stallion, Mare, Filly, or Gelding,** any age, in Harness, not exceeding 14 hands, to be driven in the ring	10	5	3	-

PRIZE MONEY BY SOCIETY . . **£78**

[Hackneys in Harness Classes must be in the Showyard not later than Tuesday evening, judged on Wednesday, and may leave the Showyard on Thursday immediately after the Afternoon Parade.]

Shed accommodation for machines for Driving Competitions—Members, 10s.; Non-Members, 20s.

HORSES IN HARNESS

(*To be judged at* 11.30 A.M. *on Friday, 24th June*)

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £	PREMIUMS Fourth £
5/-	10/-	96a	**Horse,** any age, in Harness, shown in Van or Light Lorry, it being a condition that the Horse must have been regularly worked for a period of 12 weeks prior to the first day of the Show, to be exhibited on Friday, the 24th June; only the prize-winners to take part, as required, in the Parade on Friday. Prize Money—£8, £5, £3.				

PRIZE MONEY BY SOCIETY . . **£16**

[*Note* —Entries in Class 96a close on 14th June. The entries to appear in the Jumping Programme for Friday, 24th June.]

PRIZE MONEY BY SOCIETY . . . **£996 0**
CONTRIBUTED **66 0**
CUPS, MEDALS, &c. . . **762 10**

Total Prizes for Horses £1824 10

[See Note as to EXTRA STOCK, p. 129]

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[1] Animals entered in other Classes may be entered in the Harness Classes at an additional fee of 5s. if they are eligible.

[2] *An animal that has won a President's Champion Medal in another section in this Show shall not be eligible to compete for the Medal in this section.*

JUMPING COMPETITIONS

SPECIAL REGULATIONS

(See also the Regulations on pages 83 to 92)

1. Jumping Competitions will take place on the afternoons of Wednesday, Thursday, and Friday, 22nd 23rd, and 24th June, and on the evenings of Wednesday and Thursday, 22nd and 23rd June.
2. *Entries* for each afternoon Competition will close at the Secretary's Office in the Showyard at 5 P.M. on the preceding day Entries for Evening Jumping may be received until 5 P.M. on the evening of the Competition
3. *Entry Fees.*—Wednesday and Thursday afternoons, £1, Friday, 10s Evening Jumping, 10s
4. *Accommodation* for jumping horses will be provided as follows: Covered shed in which to stand during the day free of charge; or, on application to the Secretary not less than ten days before the opening of the Show, boxes will be provided at a charge (in addition to the Entry Fee) of £1, which must be paid along with the Entry Fee at the time of application
5. Horses entered for jumping only need not enter the Showyard till 12 noon on the day of Competition, and may leave the Showyard at the close of the jumping
6. *The Jumps* may consist of Single Hurdle, Gate, Double Hurdle, Wall, and Water Jump, power being reserved by the Society to alter these, as well as the Handicaps, as may be thought desirable
7. To be eligible for Classes 1, 3, and 5, horses must have won a prize of not less than £10 during the years 1937 or 1938

ENTRY FEE	*CLASS*		*First*	*Second*	*Third*	*Fourth*	*Fifth*
		WEDNESDAY.					
		AFTERNOON.	£	£	£	£	£
20/-	1	**Horse or Pony,** any height	20	15	10	5	3
		EVENING.					
10/-	2	**Horse or Pony,** any height, confined to competitors permanently resident in Scotland. The Horse or Pony to have been the property of the competitor since 1st May 1938	10	8	5	3	2
		THURSDAY.					
		AFTERNOON.					
20/-	3	**Horse or Pony,** any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in Class 1	20	15	10	5	3
		EVENING.					
10/-	4	**Horse or Pony,** any height	10	8	5	3	2
		FRIDAY.					
		AFTERNOON.					
10/-	5	**Horse or Pony,** any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in either of Classes 1 or 3—4 inches extra for the winner of the two first prizes in Classes 1 and 3	15	10	5	3	2
		Champion Prize for most points in Prizes with *one horse* in Classes 1, 3, and 5—First Prize to count five points; Second Prize, four points; Third Prize, three points; Fourth Prize, two points; and Fifth Prize, one point—the money to be evenly divided in the event of a tie	10	–	–	–	-
		Total Prize Money for Jumping, £207.					

Special Entry Forms for above Competitions to be had on application.

SHEEP

(To be judged at 9.30 A.M. on Tuesday, 21st June)

* BLACKFACE

Judges: James Craig; Andrew D. Elliot

President's Champion Medal for best Blackface Sheep

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First	PREMIUMS Second	PREMIUMS Third	PREMIUMS Fourth
				£	£	£	£
15/-	25/-	97	**Tup** three shear and over	12	8	4	2
15/-	25/-	98	**Tup** two shear	12	8	4	2
15/-	25/-	99	**Shearling Tup**	12	8	4	2
15/-	25/-	100	**Tup Lamb**	5	3	2	-
15/-	25/-	101	**Ewe** above one shear (born before 1937), with Lamb at foot	10	5	3	2
15/-	25/-	102	**Shearling Ewe or Gimmer** (born in 1937)	10	5	3	2
15/-	25/-	103	**Ewe Lamb**	5	3	2	–

[1] **The "Angus" Perpetual Silver Challenge Cup**, value 50 guineas, for the best Blackface Sheep, "Extra Stock" eligible to compete.

[2] **The "Lochlane" Silver Challenge Cup**, value £50, for best Group of three Blackface Sheep, consisting of Ewe, Gimmer, and Ewe Lamb, drawn from above Classes, "Extra Stock" eligible to compete.

[3] **The "James Archibald" Prize**, of about £20, for the best Sheep in the Blackface Classes (excluding Lambs), "Extra Stock" eligible to compete.

PRIZE MONEY BY SOCIETY . . **£138**
CONTRIBUTED PRIZE . . . **20**

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* Formal Declarations must be made at time of entry that the conditions as regards clipping, &c., have been strictly adhered to (see Rule 43).

[1] This Cup was presented by the Angus Agricultural Association to commemorate the holding of the Society's Annual Show at Dundee in 1933. On this occasion the Cup is offered for the best Blackface Sheep. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender same to the Society and deliver it at the Society's Office when called upon to do so.

[2] Presented by Mr and Mrs Francis A. Rottenburg, Lochlane, Crieff. The Cup will become the property of an Exhibitor who shall win it five times, not necessarily in succession.

[3] This Prize consists of the annual free income from a fund of £600, gifted by the late David Archibald, Christchurch, New Zealand, to found a Prize to be offered at the Annual Shows of the Society in commemoration of his brother, the late James Archibald, Overshiels, Stow.

SHEEP

CHEVIOT

Judges: Thomas Scott; James Shiell

President's Champion Medal for best Cheviot Sheep

Entry Fees		*Class*		*Premiums*			
Members	*Non-Members*			*First*	*Second*	*Third*	*Fourth*
				£	£	£	£
15/-	25/-	104	Tup above one shear	12	8	4	2
15/-	25/-	105	**Shearling Tup**	12	8	4	2
15/-	25/-	106	**Tup Lamb**	5	3	2	–
15/-	25/-	107	**Ewe above one shear, with Lamb at foot** . .	10	5	3	2
15/-	25/-	108	**Shearling Ewe or Gimmer**	10	5	3	2
15/-	25/-	109	**Ewe Lamb**	5	3	2	–

[1] **Fife and Kinross Perpetual Gold Challenge Cup,** value £200, for best Cheviot Sheep. "Extra Stock" eligible to compete.

[2] **Borthwick Perpetual Challenge Cup,** value £25, gifted by Mr J. Borthwick, for best Sheep in the Cheviot Classes. "Extra Stock" eligible to compete.

Prize Money by Society . . £112

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[1] This Cup, along with an endowment of £400, was subscribed for by the Counties of Fife and Kinross in commemoration of the Society's first Show at Cupar-Fife in 1912. This year the Cup is offered for the best Cheviot Sheep. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

[2] Given by the Cheviot Sheep Society.

SHEEP

BORDER LEICESTER

Judges: Robert W Bell, William Faulder

President's Champion Medal for best Border Leicester Sheep

ENTRY FEES		CLASS		PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
15/-	25/	110	**Tup above one shear**	12	8	4	2
15/-	25/-	111	**Shearling Tup**	12	8	4	2
15/-	25/	112	**Tup Lamb**	10	5	3	2
15/-	25/-	113	**Ewe above one shear** . . .	10	5	3	2
15/-	25/-	114	**Shearling Ewe or Gimmer** .	10	5	3	2
15/	25/-	115	**Ewe Lamb**	5	3	2	–

Prize Money by Society . . £122

SHEEP

HALF-BRED

Judge: John L. Arnott

President's Champion Medal for best Half-Bred Sheep

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £
15/-	25/-	116	**Shearling Tup**	10	7	3
15/-	25/-	117	**Ewe** above one shear	10	5	2
15/-	25/-	118	**Shearling Ewe or Gimmer**	10	5	2
15/-	25/-	119	**Ewe Lamb**	5	3	2

Prize Money by Society . £64

OXFORD DOWN

Judge: R. H. Allan

(*All sheep to be entered or eligible for entry in the Flock-Book*)

President's Champion Medal for best Oxford Down Sheep

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £
15/-	25/-	120	**Shearling Tup**	8	5	3
15/-	25/-	121	**Shearling Ewe or Gimmer**	8	5	3
15/-	25/-	122	**Tup Lamb**	8	5	3
15/-	25/-	123	**Ewe Lamb**	5	3	2

Prize Money by Society . . £47

[1] Contributed Prizes . . . 11

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[1] Given by Oxford Down Sheep-Breeders' Association.

SHEEP

SUFFOLK

Judge John Long

(*All sheep to be entered or eligible for entry in the Flock-Book*)

President's Champion Medal for best Suffolk Sheep

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £
15/-	25/-	124	**Tup** one shear and over	10	7	3
15/-	25/	125	**Shearling Ewe or Gimmer**	10	5	2
15/-	25/-	126	**Tup Lamb**	10	5	2
15/-	25/-	127	**Ewe Lamb**	5	3	2

[1] **Silver Challenge Cup,** value £15, offered by the Suffolk Sheep Society for best Group of Suffolk Sheep, consisting of one Tup, one shear and over, one Shearling Ewe or Gimmer, one Tup Lamb, and one Ewe Lamb—the Females and Tup Lamb must be bred by Exhibitor—*drawn from above Classes.* The Cup to become the property of an Exhibitor winning it three times, not necessarily in succession.

PRIZE MONEY BY SOCIETY	£64

PRIZE MONEY BY SOCIETY	£547 0
CONTRIBUTED	31 0
CUPS, MEDALS, &c.	342 10
Total Prizes for Sheep	£920 10

[See Note as to **EXTRA STOCK,** p. 129.

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[1] Given by the Suffolk Sheep Society.

GOATS

(*To be judged at 9.30 A.M. on Tuesday, 21st June*)

Judge: Captain R. W. Rotherford

REGULATIONS FOR GOAT CLASSES.

The animals will be milked dry at 7 o'clock on the evening previous to the opening of the Show, in the presence of, and to the satisfaction of, the Steward or a representative of the Society duly authorised by him.

All exhibits must be registered either in the Herd-Book, Foundation Book or Show Register of the British Goat Society, in the name of the Exhibitor (the registered number being quoted on the entry form), or, if previously entered or owned by someone other than the Exhibitor, a transfer of ownership must be registered with the British Goat Society.

ENTRY FEES *Members*	*ENTRY FEES* *Non-Members*	*CLASS*		*PREMIUMS* *First* £	*PREMIUMS* *Second* £	*PREMIUMS* *Third* £
			President's Champion Medal for best animal in the Goat Classes			
5/-	10/-	128	**Female Goat,** any age, in milk, entered in or eligible for the Toggenburg Section or the British Toggenburg or British Alpine Section or Register of the Herd-Book . . .	3	2	1
5/-	10/-	129	**Female Goat,** any age, in milk, entered in or eligible for the Saanen Section or the British Saanen Section or Register of the Herd-Book .	3	2	1
5/-	10/-	130	**Female Goat,** any age, in milk. Any other variety	3	2	1
5/-	10/-	131	**Goatling,** over one but not exceeding two years, entered in or eligible for the Toggenburg Section or the British Toggenburg or British Alpine Section or Register of the Herd-Book . .	3	2	1
5/-	10/-	132	**Goatling,** over one but not exceeding two years. Any other variety	3	2	1
5/-	10/-	133	**Female Kid,** not exceeding one year. Any variety	3	2	1
5/-	10/-	134	**Male Kid,** not exceeding one year. Any variety .	3	2	1
5/-	10/-	135	**Milking Competition,** for quality, open to Classes 128, 129, and 130 . . .	3	2	1
5/-	10/-	136	**Milking Competition,** for quantity, open to Classes 128, 129, and 130 . . .	3	2	1
			[1] **Challenge Cup, value 20 Guineas, for the best Female Goat in the Show.**			

The Competition for Goats is recognised by the British Goat Society, Roydon Road, Diss, Norfolk, which will give Challenge Certificates (qualifying for a Championship) for the best Female Goat over two years that has borne a kid; for the best dual purpose Goat over two years that has borne a kid; and a Bronze Medal for the best female exhibit in Classes 128 to 133 inclusive.

[1] Given by the late Lord Dewar, London—to be competed for annually.

ENTRY FEES		CLASS		PREMIUMS		
Members	Non-Members			First	Second	Third
				£	£	£

GOATS

Regulations for Milking Competition (Classes 135 and 136).

Goats entered for this Competition must be entered in both the Quality and Quantity Classes.

The animals will be milked at 7 P.M. on Wednesday, 22nd June, at an appointed place in the order arranged by the Steward, and the milk of the next twenty-four hours will be taken for the Quality and Quantity Milking Competitions. The hours of milking shall be 7 A.M. and 7 P.M. on Thursday, 23rd June.

The prizes will be awarded according to the following scale of points:—

For each pound of milk	1 point.
For each complete 10 days the Goat has been in milk, with a maximum of 3·6 points	$\frac{1}{10}$ of a point.
For each ¼ lb. of fat in the milk	5 points.

In cases where the milk contains less than 3 per cent of fat at either or both milkings the Goat will be disqualified and no points shall be allotted to such Goat in the Quality Milking Competition.

In the Quantity Milking Competition points will be awarded for quantity and lactation only.

The period of lactation to be calculated from the date of kidding to the first day of the Show. No prize will be awarded to a Goat giving less than 5½ lbs. of milk per day.

Fractions of lbs. of milk and percentages of fat to be worked out in decimals and added to the total points.

A Certificate giving the last date of kidding, signed by the owner of the Goat exhibited, or his Agent, must in every case be brought to the Steward of Goats as soon as possible after the animal has arrived in the Showyard. Any Goat that has not kidded within two years preceding the date of the Show may not compete.

The milk yielded by Goats in the Showyard shall be the property of the Society.

***Note.*—No animal is allowed to compete in more than one Class, except that Goats entered in Classes 128, 129, and 130 may also be entered in Classes 135 and 136.**

Prize Money by Society	£42 0
Department of Agriculture for Scotland	12 0
Cup	21 0
Total Prizes for Goats	**£75 0**

[See Note as to **EXTRA STOCK**, p. 129.]

*PIGS

(To be judged at 9.30 A.M. on Tuesday, 21st June)

LARGE WHITE

Judge : E. Thomlinson

(All Large White Pigs to be entered or eligible for entry in the Herd-Book of the National Pig-Breeders' Association)

President's Champion Medal for best Large White Pig

ENTRY FEES Members	ENTRY FEES Non-Members	CLASS		PREMIUMS First £	PREMIUMS Second £	PREMIUMS Third £
15/-	25/-	137	**Boar** born before 1937	8	4	2
15/-	25/-	138	**Boar** born in 1937 before 1st July . . .	8	4	2
15/-	25/-	139	**Boar** born in 1937 on or after 1st July . .	6	4	2
15/-	25/-	140	**Boar** born in 1938	6	3	1
15/-	25/-	141	**Sow** born before 1937	8	4	2
15/-	25/-	142	**Sow** born in 1937 before 1st July . . .	8	4	2
15/-	25/-	143	**Sow** born in 1937 on or after 1st July . .	6	4	2
15/-	25/-	144	**Sow** born in 1938	6	3	1
			[1] **Dundee Citizens' Perpetual Silver Challenge Cup**, value about £50, for the best Large White Pig, "Extra Stock" eligible to compete.			
			[2] **Gold Medal**, value £5 (or cash), for best Large White Boar, "Extra Stock" eligible to compete.			
			[2] **Gold Medal**, value £5 (or cash), for best Large White Sow, "Extra Stock" eligible to compete.			
			[2] **Special Prizes** for Groups of four Large White Pigs bred by Exhibitor. One Boar (at least) must be included in the Group, and not more than one entry to be selected from any one Class. "Extra Stock" eligible to compete. .	5	3	2

PRIZE MONEY BY SOCIETY . . £95

[2] **CONTRIBUTED . . . 15**

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* See Rule 35.

[1] This Cup was presented by the Citizens of Dundee to commemorate the holding of the Society's Annual Show at Dundee in 1933. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender same to the Society, and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive a Medal as a memento of his winning the Trophy.

[2] Given by the National Pig-Breeders' Association.

* PIGS

LARGE BLACK

Judge: G. W. Mitchell

President's Champion Medal for best Large Black Pig

ENTRY FEES		CLASS		PREMIUMS		
Members	Non-Members			First	Second	Third
				£	£	£
15/-	25/-	145	Boar born before 1938	8	4	2
15/-	25/-	146	Boar born in 1938	6	3	1
15/-	25/-	147	Sow born before 1937	8	4	2
15/-	25/-	148	Sow born in 1937	8	4	2
15/-	25/-	149	Sow born in 1938	6	3	1

[1] **Silver Medal** for the best Large Black Boar.
[1] **Silver Medal** for the best Large Black Sow.

PRIZE MONEY BY SOCIETY	£57
[1] CONTRIBUTED PRIZES	5

ESSEX

Judge: William Ritchie

President's Champion Medal for best Essex Pig

ENTRY FEES		CLASS		PREMIUMS		
Members	Non-Members			First	Second	Third
				£	£	£
15/-	25/-	150	Boar born in 1938	6	3	1
15/-	25/-	151	Sow born in 1937 on or after 1st July	6	3	1
15/-	25/-	152	Sow born in 1938	6	3	1

[2] **Silver Medal** for the best Essex Pig.

PRIZE MONEY BY SOCIETY	£20
[2] CONTRIBUTED	10

PRIZE MONEY BY SOCIETY	£172	0
CONTRIBUTED	30	0
CUPS, MEDALS, &c.	60	0
Total Prizes for Pigs	£262	0

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* See Rule 35.

[1] Given by the Large Black Pig Society. [2] Given by the Essex Pig Society.

EXTRA STOCK

(FORMER WINNERS NOT ELIGIBLE FOR ORDINARY CLASSES)

Former winners not eligible for Ordinary Classes may be exhibited as Extra Stock, and may receive Awards as follows:—

	£	£	£
Cattle	10	5	3
Horses—Clydesdales and Hunters	10	5	3
Highland and Western Island Ponies, Shetland Ponies, and Hackneys in Harness	5	3	2
Riding Ponies (Classes 80 to 82)	3	2	1
Sheep—Blackface, Cheviot, and Border Leicester	5	3	2
Other breeds	3	2	1
Goats and Pigs	3	2	1

Animals entered as Extra Stock are eligible to compete for the President's Medals, whether former winners of these Medals or not. They are also eligible to compete for Special Prizes where the conditions of these Prizes permit.

While every endeavour will be made to see that former winners are correctly entered in the Catalogue as "Extra Stock," the Society accepts no responsibility for this, it being the duty of Exhibitors to state clearly on the Entry Form the Show at which the animal became disqualified for the Ordinary Classes. If an animal appears in the Catalogue as entered in an Ordinary Class which should appear as "Extra Stock," it cannot thereafter be transferred to the "Extra Stock" Section.

Entry Fees—same as corresponding Classes.

*POULTRY

(*To be judged at* 9.30 A.M. *on Tuesday, 21st June*)

Entries close 11th May

Judges: Captain E. Duckworth, Classes 1 to 12, 17 to 26, 35 to 46, 62 to 65, and 78 to 81; William Morgan, Classes 13 to 16, 27 to 34, 66 to 77, and 82 to 97; John Meikle, Classes 47 to 61 and 98 to 118.

[1] **Champion Challenge Silver Salver,** value £30, for the best exhibit in the Poultry Classes.

First Premium—TWENTY SHILLINGS; *Second Premium*—TEN SHILLINGS. In each Class in which there are four or more entries a Third Prize of Five Shillings may be awarded, provided there is sufficient merit in the pens. In addition to the Premiums, the Judges may award *one* Very Highly Commended, *one* Highly Commended, and as many Commended tickets in each Class as they consider justified by the number and merit of the entries.

Champion Silver Medals are offered as follows:—

1. **Best Cock, any Variety.**
2. **Best Hen, any Variety.**
3. **Best Cockerel, any Variety.**
4. **Best Pullet, any Variety.**
5. **Best Waterfowl.**
6. **Best Turkey.**
7. **Best Utility Bird (Classes 82-97.)**

† **Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.**

Entry Fees—Members, 2s. 6d.; Non-Members, 4s.

	Class	
LEGHORN—		
White	1.	Cock
	2.	Hen
	3.	Cockerel
	4.	Pullet
Any other Colour	5.	Cock
	6.	Hen
	7.	Cockerel
	8.	Pullet
MINORCA	9.	Cock
	10.	Hen
	11.	Cockerel
	12.	Pullet
SCOTCH GREY	13.	Cock
	14.	Hen
	15.	Cockerel
	16.	Pullet
PLYMOUTH ROCK—		
Barred	17.	Cock
	18.	Hen
	19.	Cockerel
	20.	Pullet
Any other Colour	21.	Cock or Cockerel
	22.	Hen or Pullet
ORPINGTON—		
Black	23.	Cock or Cockerel
	24.	Hen or Pullet

ORPINGTON—*continued.*	Class	
Any other Colour	25.	Cock or Cockerel
	26.	Hen or Pullet
WYANDOTTE—		
White	27.	Cock
	28.	Hen
	29.	Cockerel
	30.	Pullet
Partridge or *Columbian*	31.	Cock or Cockerel
	32.	Hen or Pullet
Any other Colour	33.	Cock or Cockerel
	34.	Hen or Pullet
RHODE ISLAND RED	35.	**Cock**
	36.	**Hen**
	37.	**Cockerel**
	38.	**Pullet**
SUSSEX—		
Light	39.	**Cock**
	40.	**Hen**
	41.	**Cockerel**
	42.	**Pullet**
Any other Variety	43.	**Cock**
	44.	**Hen**
	45.	**Cockerel**
	46.	**Pullet**

Special Entry Forms for Poultry Classes. *** See Regulations 66 and 67.**

[1] **Given by the late Lord Dewar. The Salver will become the property of an exhibitor who shall win it three times, not necessarily in succession.**

† **In 1939 this Rule will be altered so that Cockerels and Pullets shall be eligible which were hatched after 1st November of the year preceding the Show.**

	Class	
DORKING—		
Coloured	47.	Cock
	48.	Hen
	49.	Cockerel
	50.	Pullet
Silver Grey	51.	Cock
	52.	Hen
	53.	Cockerel
	54.	Pullet
SCOTS DUMPY	55.	Cock
	56.	Hen
	57.	Cockerel or Pullet
BARNEVELDER	58.	Cock
	59.	Hen
	60.	Cockerel
	61.	Pullet
INDIAN GAME	62.	Cock
	63.	Hen
	64.	Cockerel
	65.	Pullet
OLD ENGLISH GAME	66.	Cock
	67.	Hen
	68.	Cockerel
	69.	Pullet
BANTAM—		
Game—Old English	70.	Cock
	71.	Hen
Game—Modern	72.	Cock
	73.	Hen
Other than Game	74.	Cock
	75.	Hen
Any Variety	76.	Cockerel
	77.	Pullet
ANY OTHER RECOGNISED BREED OF POULTRY	78.	Cock
	79.	Hen
	80.	Cockerel
	81.	Pullet
UTILITY POULTRY—		
Leghorn—any Variety	82.	Cock or Cockerel
Any other Variety—light breed	83.	Cock or Cockerel
Wyandotte—any Colour	84.	Cock or Cockerel
Rhode Island Red	85.	Cock or Cockerel
Welsummer	86.	Cock or Cockerel

UTILITY POULTRY—*contd.*	Class	
Any other Variety—heavy breed	87.	Cock or Cockerel
Leghorn—White	88.	Hen or Pullet
Leghorn—any other Colour	89.	Hen or Pullet
Wyandotte—any Colour	90.	Hen or Pullet
Rhode Island Red	91.	Hen or Pullet
Barnevelder	92.	Hen or Pullet
Rock—any Colour	93.	Hen or Pullet
Welsummer	94.	Hen or Pullet
Any other Variety	95.	Hen or Pullet
ANY CROSS FOR LAYING PURPOSES	96.	Hen
ANY CROSS FOR LAYING PURPOSES	97.	Pullet
DUCKS—		
Aylesbury	98.	Drake
	99.	Duck
	100.	Drake (young)
	101.	Duck (young)
Orpington	102.	Drake
	103.	Duck
	104.	Drake (young)
	105.	Duck (young)
Indian Runner	106.	Drake
	107.	Duck
Any other Variety	108.	Drake
	109.	Duck
GEESE	110.	Gander
	111.	Goose
TURKEYS	112.	Cock
	113.	Hen
TABLE POULTRY—		
Any pure Breed	114.	Cock
	115.	Cockerel
Any Cross	116.	Cock
	117.	Cockerel
Any Pure Breed or Cross	118.	Pair of Pullets

AMOUNT OF POULTRY PREMIUMS, £206, 10s.

Special Entry Forms for Poultry Classes.

*DAIRY PRODUCE

(*To be judged at* 9.30 A.M. *on Tuesday,* 21*st June*)

Judge : George Fraser

No Exhibitor to show more than one lot in any Class

Entry Fees—Members, 5s.; Non-Members, 7s. 6d.

Class.	Premiums. 1st. £	2nd. £	3rd. £	4th. £	5th. £
1. Powdered Butter, not less than 2 lb.	4	3	2	1	–
2. Fresh Butter, two 1-lb. lots, to be made up in form of bricks *without any prints*	4	3	2	1	–
3. Cheddar Cheese, 56 lb. and upwards	9	5	3	2	1
4. Cheese, 14 lb. and under	5	3	2	1	–
Total			£51		

Special Entry Forms for Dairy Produce.

* See Regulations 75 and 76.

Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 98-101.

HONEY, &c.

(*To be judged at* 10 A.M. *on Tuesday*, 21*st June*)

Judge: Rev. J. Beveridge

OPEN CLASSES

Entry Fees—2s. 6d. each.

Class.		Premiums.		
		1st.	2nd.	3rd.
1.	Collection of Appliances suitable for a beginner's outfit for Bee-keeping. A card naming all the articles, along with the price at which they will be supplied for one year from date, to be fixed to the exhibit	20/-	15/-	10/-
2.	Best and most complete Frame Hive for general use, with any improvements. Unpainted	20/-	15/-	10/-
3.	Best and most complete Hive. Unpainted. Price not to exceed 37/6	20/-	15/-	10/-
4.	Six Sections of Comb Honey, excluding Heather Honey	20/-	15/-	10/-
5.	Six Sections of Heather Honey	20/-	15/-	10/-
6.	Six Jars of Run or Extracted Light-coloured Honey, approximate weight 6 lb.	20/-	15/-	10/-
7.	Six Jars of Run or Extracted Medium or Dark-coloured Honey, excluding Heather Honey, approximate weight 6 lb.	20/-	15/-	10/-
8.	Six Jars of pressed Heather Honey in liquid form, approximate weight 6 lb.	20/-	15/-	10/-
9.	Six Jars of Granulated Honey, approximate weight 6 lb.	20/-	15/-	10/-
10.	Two shallow Frames of Comb Honey for extracting purposes	20/-	15/-	10/-
11.	Best display of Honey in any form suitable for a shop window in space 4 feet by 4 feet. Weight of honey not to exceed 40 lb.	60/-	30/-	20/-
12.	Best exhibit of not less than 1 lb. of Wax in any form	20/-	15/-	10/-
13.	Best exhibit of not less than 1 lb of Wax made into shapes for retail trade and over-counter trade. Convenience in packing to be taken into consideration	20/-	15/-	10/-
14.	Observatory Hive with Queen and Bees—two or more frames	50/-	30/-	20/-
15.	Observatory Hive with Queen and Bees—one frame, no super	40/-	30/-	15/-

(Confined to Scottish Exhibitors.)

16.	One Standard Frame of Comb Honey for extracting purposes	20/-	15/-	10/-
17.	Six Sections of Comb Honey, excluding Heather Honey	20/-	15/-	10/-
18.	Six Sections of Heather Honey	30/-	20/-	10/-
19.	Six Jars of Run or Extracted Medium or Dark-coloured Honey, excluding Heather Honey, approximate weight 6 lb.	30/-	20/-	10/-
20.	Six Jars of pressed Heather Honey in liquid form, approximate weight 6 lb.	20/-	15/-	10/-
21.	Six Jars of Run or Extracted Light-coloured Honey, approximate weight 6 lb.	30/-	20/-	10/-

SILVER CUP OR TAZZA.

Presented by the late Mr R. Y. Howie, Rutherglen.

1. To be competed for annually at the Highland and Agricultural Society's Show, and awarded to the competitor gaining most points in the Classes for Honey and Wax only, calculated on the following basis: 1st prize, 3 points; 2nd prize, 2 points; 3rd prize, 1 point. In the event of a tie, the competitor having most first prizes to be adjudged the winner. The winner, until the trophy is won outright, shall hold the Cup for one year.

2. The Cup to be won outright by the competitor first winning it three times within five years.

3. Any competitor having official connection with an Agricultural College shall not be eligible to compete for the Cup.

Silver and Bronze Medals will be awarded by the Scottish Bee-Keepers' Association to the First and Second winners of the greatest number of points in the Classes for Honey and Wax only, calculated on the following basis: 1st prize, 3 points; 2nd prize, 2 points; 3rd prize, 1 point.

PRIZE MONEY BY SOCIETY	£47, 0s. 0d.
CONTRIBUTED BY SCOTTISH BEE-KEEPERS' ASSOCIATION . .	£10, 10s. 0d.
SILVER CUP OR TAZZA PRESENTED BY THE LATE MR R. Y. HOWIE	£6, 0s. 0d.

Special Entry Forms for Appliances and Honey.

RULES AND REGULATIONS.

1. All exhibits must be despatched in time to be delivered at the Showyard not later than 6 P.M. on Monday, the day before the opening of the Show. Under the railway regulations, exhibitors will require to pay return carriage and cartage when despatching. Return carriage-paid labels will be supplied by the Secretary, and must be addressed for the return journey, and have numbers of Classes on same. Non-compliance with this regulation will mean that the exhibit will be left in the Showyard. **Boxes containing hives, jars, or sections must be *screwed* and not nailed, and the hives, bottles, and sections so placed that they can be lifted out and replaced without disturbing the packing.**

2. The number of the exhibit will be sent by the Secretary (as entered on the printed slip) and must be placed on every exhibit—viz., **Jars:** on side of jar about half an inch from the foot. **Sections** and **Frames:** at right top corner of the glass. **Wax:** at right top corner of the glass. Also on **1 lb. Cakes:** on the underside. No goods will be staged unless this rule is complied with. All competitors must leave the Bee Shed by 9 A.M. on Tuesday morning.

3. No card, trade mark, or name of the exhibitor may be placed upon any part of an exhibit. Every article exhibited must be the property of the exhibitor, and all honey must have been gathered in the natural way within Great Britain, Northern Ireland, and Eire (Irish Free State), by bees the property of the exhibitor.

4. Comb Honey Sections, 4¼ inches by 4¼ inches, to be staged in cardboard boxes glazed on both sides, showing not less than 3½ inches by 3½ inches of comb surface clear of points of lacing, but allowing easy access to the Judge. Sections with fixed glass will be disqualified.

Shallow Frames,—no paper edging is permissible and each frame must be exhibited in a separate glazed case.

5. All Run, Extracted, and Granulated Honey must be shown in the usual mercantile Glass Jars holding approximately 1 lb., except in Class 11.

6. No exhibitor shall be allowed to take more than one prize in any one class.

7. The Judge shall be empowered to withhold prizes in case of insufficient merit.

8. Should there be in any class three or less than three entries, the value of the first prize may be reduced at the discretion of the Judge to that of the second, the second to that of the third, and no third prize will be awarded.

9. The Judge will commence his inspection at 10 A.M. on Tuesday, and the Bee Shed will be closed to the public during the judging.

10. Exhibits of Honey may be placed in their positions in the shed before the opening and removed at the close of the Show by exhibitors themselves or their representatives. In the event of neither the exhibitor nor a person with written authority from the exhibitor being present to place or remove the exhibits, they will be placed and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of the exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. In the case of exhibits which are not removed by 5.30 P.M. on the closing day of the Show, the Society will hold itself at liberty to hand them over to the railway companies for despatch to the respective exhibitors.

11. No lot can be removed from the yard till 4 P.M. on Friday, the last day of the Show.

12. The Society undertakes no responsibility for the receipt or despatch of exhibits, nor for any injury exhibits may sustain during the Show or otherwise.

13. **Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 98-101.**

RURAL INDUSTRIES

(To be judged at 9.30 A.M. on Tuesday, 21st June)

Judges: Miss J. Bruce, Classes 1, 2, 3, 4, 5, 6, 7, 8, 9, 18, 19, 20, 25 and 27; Miss A. D. Angus, Classes 10, 11, 12, 13, 22, 23, 24 and 26; Henry G. Paterson, Classes 14, 15, 16, 17 and 21.

Entry Fee, 2s. 6d. each article.

Each article must form a separate exhibit

OPEN CLASSES.

SHETLAND KNITTING.

Class.	*Exhibits to be made from Shetland Wool.*	Premiums. 1st.	 2nd.	 3rd.
1.	Fine Lace Shawl or Scarf	£3	£2	£1
2.	Fine Lace Goods other than above	3	2	1
3.	Jumper or Cardigan—with or without sleeves	3	2	1
4.	Exhibits other than above	2	1	10/-

TWEEDS.

5.	Harris or other Tweed—Hand-woven	3	2	1
6.	Tartan—Vegetable-dyed and Hand-woven	3	2	1
7.	Carriage Rug or Plaid—Hand woven	3	2	1

MISCELLANEOUS.

8.	Hook-Through Floor Rug (new wool)	3	2	1
9.	Any other variety Floor Rug (new wool)	3	2	1
10.	Specimen of White Embroidery—to be exhibited unwashed	3	2	1
11.	Specimen of Coloured Embroidery—silk or cotton (canvas work not eligible)	3	2	1
12.	Specimen of Coloured Embroidery—woolwork (canvas work not eligible)	3	2	1
13.	Specimen of Old English Quilting	3	2	1
14.	Pair of Leather Gloves	2	1	10/-
15.	Specimen of Leather Work other than Gloves	2	1	10/-
16.	„ Hand-painted Pottery	2	1	10/-
17.	„ Woodcraft (small article)	2	1	10/-
18.	Home-spun Yarn—2-3 cuts	2	1	10/-
19.	Specimen of Hand-made Lace other than Crochet	3	2	1
20.	Men's Golf or Kilt Hose	2	1	10/-
21.	Shepherd's Crook, Hand-made	2	1	10/-
				£106 0

RURAL INDUSTRIES—*continued.*

CONFINED CLASSES.

Open to Women's Rural Institutes and Members thereof in the whole of Scotland.

	Premiums. 1st.	2nd.	3rd.	
22. Specimen of Tapestry (Canvas Work) in Florentine, Grospoint, or Petit Point Stitches . . .	£3	£2	£1	
23. Specimen of Candlewick Work (any article) . .	2	1	10/-	
24. Specimen of Smocking (any article) . . .	3	2	1	
25. Hand-knitted Woollen Jumper or Cardigan, not Shetland or Fair Isle Pattern	2	1	10/-	
26. Hand-sewn Underwear, 2 articles . . .	2	1	10/-	
27. Hand-knit Woollen Socks, 4 ply, plain knitting. .	2	1	10/-	
				£26

PRIZE MONEY BY SOCIETY £132

NOTE.—(*a*) No exhibit may be entered in more than one Class.
(*b*) All exhibits must have been completed within the twelve months preceding the Show.
(*c*) No exhibit mounted under glass will be accepted at the Show.

REGULATIONS.

1. The Competition, except where otherwise stated, is open to competitors from all parts of Great Britain, Northern Ireland, and Eire (Irish Free State). Societies or Institutes, as well as individuals, shall be allowed to compete.

2. Every exhibit must be the work either of the exhibitor or of a member of the exhibiting Society or Institute, and must have been completed within the twelve months preceding the Show.

3. An entry fee of 2s. 6d. for each exhibit is payable at the time of entry.

4. Exhibits will be received in the Showyard not later than 8 P.M. on Monday, the day before the opening of the Show. Judging will commence at 9.30 A.M. on Tuesday. The section will be closed to the public during the judging. Exhibits shall not be removed till after the close of the Show.

5. In no case shall a prize be awarded unless the Judge deems the exhibit to have sufficient merit; and where only one or two articles are entered in a class, and the Judge considers them unworthy of the prizes offered, it shall be in his or her power to award a lower prize.

6. Exhibits shall be entirely at the risk of exhibitors, who shall be solely responsible for delivery and removal of their own exhibits. In the event of neither the exhibitor nor a person with written authority from the exhibitor being present to remove exhibits, these will be removed by persons hired and paid by the Society. The placing and despatching of exhibits will be done on the understanding that the persons are hired to do the work on behalf of the exhibitors and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. A receipt signed by the exhibitor, on a form to be issued by the Secretary, must be delivered before any exhibit is handed over to the exhibitor or his or her representative.

On the last day of the Show the Shed will be closed to the public at 4.30 P.M., but no exhibit may be removed until 5 P.M.

7. Exhibitors shall be allowed to attach to their exhibits a notice indicating where (in the Showyard or elsewhere) similar articles may be purchased.

8. Exhibits must not be sent to the Society's Office previous to date of Show. Labels, &c., will be posted to exhibitors about fourteen days prior to the Show.

9. All exhibits to be sent to the Showyard in packing, sufficiently strong, to be used for return.

10. **Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 98-101.**

Special Entry Forms for Rural Industries Section.

BUTTERMAKING COMPETITIONS

Judges { *Open*—A. M'Bride
Championship—W. M. Lennox

Entry Fee, 2s. 6d.

The Society will hold an open Buttermaking Competition on Wednesday and Thursday, 22nd and 23rd June.

The Competitors will be balloted into sections containing, as nearly as possible, an equal number of Competitors, and each section will form a separate competition with separate prizes. The Secretary will forward to Competitors, a few days before the Competitions, a note of the days and hours at which they are required to attend.

The sections and prize money will be as follows:—

WEDNESDAY, 22ND JUNE.

Open Competition.

Section 1	£5, £3, £2, £1.
Section 2	£5, £3, £2, £1.

THURSDAY, 23RD JUNE.

Open Competition (continued).

Section 3	£5, £3, £2, £1.

Championship { *First :* Gold Medal.
Second : Silver Medal.

Competitors in the Championship Competition will consist of the First, Second, and Third Prize Winners in each of the Sections 1 to 3 inclusive.

Competitors will be distinguished by Numbers, which, with Competitor's name and address, will be entered in the Catalogue.

The decision of the Directors of the Society in all matters relating to the Competition shall be final.

Entry forms may be obtained from the Secretary, or from Mrs D. G. More, Hon. Secretary, British Dairymaids' Association, 92 Montpelier Park, Edinburgh, who has kindly agreed to receive entries. These must be lodged *not later than Thursday, 19th May.*

PRIZE MONEY BY SOCIETY, £33.

HORSE-SHOEING AND SHOE-MAKING

Open to Shoeing-Smiths from any part of Great Britain, Northern Ireland, and Eire (Irish Free State).

Horses provided for this Competition cannot be entered in any other Class.

Special Entry Forms for Horse-Shoeing and Shoe-Making Competitions.

HORSE-SHOEING COMPETITION

Judges: Andrew Young, M.R.C.V.S.; George Marshall; John Ritchie

THURSDAY AND FRIDAY, 23RD AND 24TH JUNE

FARM HORSES.

1st Prize, £5, Silver Tea Service,* and Gold Medal. ||
2nd Prize, £5 and Canteen of Cutlery.†
3rd Prize, £5 and Gold Medal.‡
4th Prize, £4 and Gold Medal.§
5th Prize, £3.
6th Prize, £2.
7th Prize, £2.
8th Prize, £1.
9th Prize, £1.

* Silver Tea Service given by The Scottish Iron & Steel Co., Ltd.
† Canteen of Cutlery given by Messrs Neilson & Cleland, Ltd., Coatbridge.
|| Gold Medal, given by National Master Farriers' and Blacksmiths' Association, to be awarded to the competitor obtaining the highest number of points in this Class.
‡ Gold Medal given by the Mustad Horse Nail Company.
§ Gold Medal given by Capewell Horse Nail Company.

PRIZE MONEY BY SOCIETY	£18
SILVER TEA SERVICE AND £5 BY THE SCOTTISH IRON & STEEL CO., LTD., GLASGOW . . .	£10
MESSRS WILLIAM MARTIN, SONS, & CO., COATBRIDGE .	£5
CUTLERY BY MESSRS NEILSON & CLELAND, LTD., COATBRIDGE	£4
GOLD MEDAL BY NATIONAL MASTER FARRIERS' AND BLACKSMITHS' ASSOCIATION	£4
GOLD MEDAL BY MUSTAD HORSE NAIL CO. . .	£2
GOLD MEDAL BY CAPEWELL HORSE NAIL CO. . .	£2
TOTAL .	£45

REGULATIONS.

1. Entries must be made with the Secretary not later than 27th April. Entry Fee, 2s. 6d. for each Class. Entry Forms may be had on application.

2. The Competition will take place in the Showyard, and will be decided by points, time being taken into consideration. Each Competitor must make and fix one fore and one hind shoe, having previously taken off the old shoes. The shoes must be fullered, with low calkins, and with toe-pieces on hind shoes only. The use of files and wire brushes is not permitted. Each Competitor must bring his own tools, nails, and a striker. The striker will not be allowed to touch the horse's hoof. The local Blacksmiths' and Farriers' Association will

provide blowers, forges and anvils. The horses to be shod will also be provided by the Association. Forges and horses will be balloted for.

3. Competitors must attend at the Horse-Shoeing Stance **half an hour before they are due to compete.**

4. The Competitor and his striker will be admitted to the Yard free of charge on the day of Competition on presentation of tickets which will be sent to the Competitor for the purpose.

Waverley horse-shoe iron will be used in this Competition and will be supplied by The Scottish Iron & Steel Co., Ltd., Glasgow. Messrs Neilson & Cleland, Ltd., Coatbridge, will provide the necessary Gartshore smithy coal.

SHOE-MAKING COMPETITION

Judges: Robert Hall; George Marshall

WEDNESDAY, 22nd June.

1st Prize, £5 and Gold Watch.*
2nd Prize, £4 and Canteen of Cutlery.†
3rd Prize, £3 and Gold Medal.||

4th Prize, £2.
5th Prize, £1.

* Gold Watch given by Messrs William Martin, Sons, & Co., Coatbridge.
† Canteen of Cutlery given by Messrs Neilson & Cleland, Ltd., Coatbridge.
|| Gold Medal given by Mustad Horse Nail Company.

Prize Money by Society	£5
Gold Watch and £5 given by William Martin, Sons, & Co., Coatbridge	£10
The Scottish Iron & Steel Co., Ltd., Glasgow .	£5
Canteen of Cutlery given by Messrs Neilson & Cleland, Ltd., Coatbridge	£4
Gold Medal given by Mustad Horse Nail Company .	£2
Total	£26

REGULATIONS.

1. Entries must be made with the Secretary not later than 27th April. Entry Fee, 2s. 6d. Entry Forms may be had on application.

2. Each Competitor must make one fore shoe and one hind shoe.

3. Each shoe must be made from $18\frac{1}{2}'' \times 1\frac{1}{4}'' \times \frac{9}{16}''$ iron, which will be provided at the Stance.

4. The fore shoe to be fullered and clipped, and the hind shoe fullered, clipped, and toed.

5. The use of files and wire brushes is prohibited.

6. Time allowed will be limited to 40 minutes.

7. Competitors must bring their own tools and a striker, and must attend at Horse-Shoeing Stance **15 minutes before they are due to commence.**

8. The Competitor and his striker will be admitted to the Yard free of charge on the day of Competition on presentation of tickets which will be sent to the Competitor for the purpose.

Dundyvan horse-shoe iron will be used in this Competition and will be supplied by Messrs William Martin, Sons, & Co., Coatbridge. Messrs Neilson & Cleland, Ltd., Coatbridge, will provide the necessary Gartshore smithy coal.

LIVE STOCK JUDGING COMPETITION

Special Entry Forms for Live Stock Judging Competition.

1. The Society will hold a Live Stock Judging Competition on Thursday, 23rd June, commencing at 10 A.M.

2. The Competition shall be open to all persons 18 years and under 23 years of age at the date of the Competition.

3. Teams from Agricultural Colleges or from Young Farmers' Clubs in Scotland shall be allowed to compete. The members of these teams shall also enter as individual Competitors. Five members shall form a team.

4. Entries must be lodged with the Secretary of the Highland and Agricultural Society not later than 10 A.M. on **Thursday, 12th May.** An entry fee of 2s. 6d. shall be paid by each Competitor. Entries of teams must be made in the same way, but no additional fee shall be charged for a team over and above the fee of 2s. 6d. for each individual member.

5. The Stock to be judged shall consist of—

(*a*) Cattle (three classes) . .	Shorthorn. Galloway. Ayrshire or British Friesian.
(*b*) Horses (two classes) . .	Clydesdales.
(*c*) Sheep (three classes) . .	Blackface. Cheviot. Border Leicester.

There will be four animals in each class. The animals to be judged shall be chosen by the Society's Stewards. The Society reserves the right to modify the nature of the classes should difficulty arise in finding suitable material amongst the animals exhibited at the Show.

6. In Judging, breed type shall be taken into account. All stock shall be considered free from acquired blemishes or unsoundness. The Competitors shall judge in groups, and ten minutes shall be allowed for the judging of each class.

7. Competitors are forbidden to discuss the Stock with each other, or with any other person, until the conclusion of the whole Competition.

8. The method of awarding points shall be decided by the Directors of the Society, and their decision in all matters relating to the Competition shall be final.

9. Prizes shall be awarded as follows:—

Individual Competition . . .	£5, £4, £3, £2, £1.
Team Competition—	
1st	£10 and 5 Medium Silver Medals.
2nd	£5 and 5 Medium Bronze Medals.
Special Prize for College team placed highest in Competition . .	£5.

[1] **'Glasgow Herald' Challenge Cup,** value £50, to be awarded each year to the team winning the First Prize in the Team Competition.

[1] **Gold Medal** to be awarded to the highest individual scorer.

The Society reserves the right to reduce the number of prizes in the event of there being less than twenty Competitors in the Individual Competition and less than three teams in the Team Competition.

TOTAL PRIZE MONEY BY SOCIETY, £35.

[1] Given by Messrs George Outram & Co., Ltd., Glasgow.

HEDGE-CUTTING COMPETITIONS

For work done in Dumfriesshire during January, February, and March 1938

Class

1. Best Cut and Laid Hedge with Brush at Back, confined to Estate Workmen.

2. Best Cut and Laid Hedge with Brush at Back, confined to Farmers and Farm Workmen.

3. Best Switched Hedge, confined to Estate Workmen.

4. Best Switched Hedge, confined to Farmers and Farm Workmen.

Hedge: Minimum length 100 yards, which need not be continuous provided the length is in the same line or immediately at right angles.

The work may be done singly or by two men working as a pair. In the latter case any prize money awarded will be divided.

Three Prizes in each Class—namely, £3, £2, and £1.

No Entry Fees. Entries close on 31*st March* 1938. *Entry Forms may be had on application.*

ABSTRACT OF PREMIUMS.

GIVEN BY THE SOCIETY.

	£	s.	d.
Cattle	£1250	0	0
Horses	996	0	0
Jumping Competitions	207	0	0
Sheep	547	0	0
Goats	42	0	0
Pigs	172	0	0
Poultry	206	10	0
Dairy Produce	51	0	0
Honey, &c.	47	0	0
Rural Industries	132	0	0
Buttermaking Competitions	33	0	0
Horse-Shoeing and Shoe-Making Competitions	23	0	0
Live Stock Judging Competition	35	0	0
Hedge-Cutting Competitions	24	0	0
Medals to Breeders, &c.	50	0	0
Forestry [1]	40	0	0
	£3855	10	0

CONTRIBUTED PRIZES, CUPS, &c.

	£	s.	d.
President's Champion Medals	30	0	0

CATTLE.

*The late Mr William Duthie—Silver Cup	£150	0	0			
*Mr W. M'Nair Snadden—Silver Cup	50	0	0			
Tweeddale Gold Medal	25	0	0			
*J. Baird & Co. (Falkirk) Ltd.—Emilio R. Casares, jun.—Memorial Cup	52	10	0			
The Shorthorn Society (and 2 Medals)	40	0	0			
*Mr J. E. Kerr—Silver Cup	50	0	0			
*The late Sir George Macpherson Grant, Bart.—Silver Cup	50	0	0			
*Mr Eduardo Estanguet, Argentina—Silver Cup	52	10	0			
*Mr J. E. Kerr—Silver Cup	50	0	0			
*Mr Falconer L. Wallace—Silver Cup	50	0	0			
Aberdeen-Angus Cattle Society—Gold Medal	10	0	0			
*Renfrewshire Perpetual Gold Challenge Cup	250	0	0			
*Galloway Cattle Society—Dr Gillespie Memorial Trophy	50	0	0			
*Galloway Cattle Society—Silver Cup	50	0	0			
*Mrs Brown, Kirkbrex, Glasgow—Knockbrex Challenge Cup	50	0	0			
*General Sir Ian Hamilton, G.C.B.—Silver Cup	50	0	0			
*Highland Cattle Society of Scotland—Silver Cups	89	5	0			
*Corporation of Edinburgh Perpetual Gold Challenge Cup	100	0	0			
Cowhill Champion Cup	30	0	0			
Ayrshire Cattle Herd-Book Society	20	0	0			
*Lady Rachel Workman MacRobert—Champion Silver Bell	52	10	0			
*British Friesian Cattle Society—Silver Cup	52	10	0			
British Friesian Cattle Society	50	0	0			
				1424	5	0
Carry forward				£5309	15	0

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[1] Grant to Royal Scottish Forestry Society for Forestry Section.

* Challenge Prizes.

ABSTRACT OF PREMIUMS—*continued*

Brought forward . . .		£5309 15 0

HORSES.

*Paisley Perpetual Gold Challenge Cup . . .	£300 0 0	
*Clydesdale Horse Society—Cawdor Challenge Cups . .	105 0 0	
"William Taylor" Memorial Committee . . .	10 0 0	
*Mr James Clark—Silver Challenge Cup . .	52 10 0	
*Dumfriesshire Hunt—Dumfries Centenary Silver Challenge Cup	100 0 0	
*Dundee Citizens' Perpetual Silver Challenge Cup . .	50 0 0	
Hunters' Improvement and National Light Horse Breeding Society—Gold Medal	5 0 0	
*Mrs Moncrieff Wright—Kinmonth Perpetual Gold Challenge Quaich	100 0 0	
Department of Agriculture for Scotland . . .	40 0 0	
Highland Pony Society	16 0 0	
A few Members of the Shetland Pony Stud-Book Society—Perpetual Silver Challenge Cup	50 0 0	
Shetland Pony Stud-Book Society (Medal) . . .	...	
		828 10 0

SHEEP.

*Angus Agricultural Society—Silver Cup . . .	£52 10 0	
*Mr and Mrs Francis A Rottenburg—"Lochlane" Silver Challenge Cup	50 0 0	
"James Archibald" Prize	20 0 0	
*Fife and Kinross Perpetual Gold Challenge Cup . .	200 0 0	
*Cheviot Sheep Society—Borthwick Perpetual Challenge Cup	25 0 0	
Oxford Down Sheep-Breeders' Association . . .	11 0 0	
*Suffolk Sheep Society—Silver Cup	15 0 0	
		373 10 0

GOATS.

Department of Agriculture for Scotland . . .	£12 0 0	
*The late Lord Dewar—Silver Cup	21 0 0	
		33 0 0

PIGS.

*Dundee Citizens' Perpetual Silver Challenge Cup . .	£50 0 0	
National Pig-Breeders' Association—Gold Medals and Prize Money	25 0 0	
Large Black Pig Society (and 2 Medals) . . .	5 0 0	
Essex Pig Society (and Silver Medal) . . .	10 0 0	
		90 0 0

POULTRY.

*The late Lord Dewar—Champion Challenge Silver Salver . . .		30 0 0

HONEY.

The Scottish Bee-Keepers' Association (and 2 Medals) .	£10 10 0	
The late Mr R. Y. Howie—Silver Cup or Tazza . .	6 0 0	
		16 10 0
Carry forward		£6681 5 0

* Challenge Prizes.

ABSTRACT OF PREMIUMS—*continued*

Brought forward . . .		£6681 5 0

HORSE-SHOEING AND SHOE-MAKING.

Messrs W. Martin, Sons, & Co., Coatbridge (Gold Watch and £10)	£15 0 0	
The Scottish Iron & Steel Co., Ltd., Glasgow (Silver Tea Service and £10)	15 0 0	
Messrs Neilson & Cleland, Ltd., Coatbridge (Cutlery)	8 0 0	
National Master Farriers' and Blacksmiths' Association (Gold Medal)	4 0 0	
Mustad Horse Nail Co. (2 Gold Medals)	4 0 0	
Capewell Horse Nail Co. (Gold Medal)	2 0 0	
		48 0 0

STOCK JUDGING COMPETITION.

*Messrs George Outram & Co., Ltd., Glasgow—'Glasgow Herald' Challenge Cup (and Gold Medal)	50 0 0
	£6779 5 0

* Challenge Prizes.

JOHN STIRTON, *Secretary.*

8 Eglinton Crescent,
Edinburgh 12. *February* 1938.

SILVER MEDALS FOR NEW OR IMPROVED IMPLEMENTS.

See Regulations on page 96.

FORESTRY EXHIBITION.

For information as to above, apply to the Secretary, Royal Scottish Forestry Society, 8 Rutland Square, Edinburgh 1.

The Society's Show for 1939 will be held at Edinburgh.

MEMBERS ADMITTED SINCE THE LIST WAS PUBLISHED IN APRIL 1937.

ARRANGED ACCORDING TO SHOW DISTRICTS.

(Elected 2nd June 1937 and 5th January 1938.)

1.—GLASGOW DIVISION

ARGYLL

Admitted

1938 Campbell, William Duff, National Bank of Scotland, Bridgend, Islay
1938 Hall, Donald S. Macalister, Torrisdale Castle, Carradale
1937 MacDiarmid, Archibald, Island House, Isle of Tiree
1937 M'Kean, Mrs S. M., Drimlee, Inveraray
1937 MacKinnon, Hugh, Crosspol, Isle of Tiree
1937 Muir, William, Farm Manager, Ballymenach, Campbeltown
1937 Sime, G. M., National Bank Buildings, Inveraray
1938 Smith, Robert, Neriby, Bridgend, Islay

AYR

1937 Agnew, Mrs Jessie B., Broadmeadows, Kilmarnock
1937 Hastings, Robert J., Clydesdale Bank, Ltd., Ayr
1938 M'Connell, James, Brownhill, Glengarnock
1938 MacLaren, Norman P., Cubrieshaw, West Kilbride
1938 Miller, Mrs John, 41 Bellevue Crescent, Ayr
1937 Murdoch, William A., Balgreen, Hollybush
1938 Stephen, Miss Mary Templeton, Auchenfail, Mauchline
1938 Templeton, Thomas, Hillhead, Sorn
1938 Thomson, T. B. L., Townhead o Threepwood, Beith
1937 Wilson, Miss K. M., 34 Miller Road, Ayr

BUTE

1937 Crawford, Robert, Seabank Buildings, 26 Argyle Street, Rothesay
1937 Muir, William, Farm Manager, Sannox Farm, Corrie, Isle of Arran

LANARK

1937 Allan, James, West Mains, Stonehouse
1937 Brown, Albert A., 51 Airlie Gardens, Hyndland, Glasgow, W.2
1937 Carmichael, Alexander, Braco Farm, Plains, by Airdrie
1938 Crawford, John Alexander, 61 Bishop Street, Glasgow, C.3
1937 Fife, William, Rhindmuir Farm, Baillieston
1937 Galloway, Barry M. (Messrs Thomas Borthwick (Glasgow), Ltd.), 58 Waterloo Street, Glasgow
1937 Grant, William, 80 Kingswood Drive, King's Park, Glasgow
1938 Hamilton, William Cowper, 522 Gallowgate, Glasgow, S.E.
1937 Harvey, Miss Marion, Commercial Hotel, Airdrie
1937 Hiddleston, Mrs Helen, 2 Buckingham Street, Glasgow
1938 Lennox, John, 1 Partickhill Road, Glasgow, W.1
1938 MacCormick, Ian, Manager, Scottish Agricultural Industries, Ltd., 53 Bothwell Street, Glasgow
1937 M'Gregor, John (Messrs Spillers, Ltd.), 95 Bothwell Street, Glasgow
1937 M'Gugan, James Andrew, Rowallan, Stepps, by Glasgow
1937 M'Nay, Alexander P., 81 Hope Street, Glasgow
1938 Naismith, Archibald, c/o British Basket Company, 332 Crown Point Road, Glasgow
1937 Neilson, Thomas, Bents Farm, Chapelton, Hamilton
1937 Nicolson, S. J., 65 Wolseley Street, Glasgow, C.5
1937 Prangnell, Mrs Elizabeth Helen, Finlaggan, Waterloo Road, Lanark
1938 Primrose, William G., Centre Street Mills, Glasgow, C.5
1937 Russell, Andrew, jun., Summerston, Maryhill, Glasgow
1938 Russell, Miss Elizabeth Gall, Langlees, Biggar
1937 Russell, James Watt, Summerston, Maryhill, Glasgow
1937 Stewart, Daniel, Corbichall, Carstairs
1937 Stirrat, James (Scottish Land Cultivators, Ltd.), 16 Westbourne Gardens, Kelvinside, Glasgow
1938 Strang, James, 95 Main Street, Chapelhall, by Airdrie
1937 Sutherland, Stewart, Dunrobin, East Kilbride
1938 Watson, Melville Ernest, Auction Market, Biggar
1937 Wight, James A., 48 Mount Stuart Street, Glasgow, S.1
1937 Wilson, William, Caldermill, Strathaven
1937 Wilson, William, Udston Farm, Stonehouse

RENFREW

1937 Boyd, John, 11 Balmeg Avenue, Giffnock
1937 Crawford, John, Hatfield, Paisley
1937 Girdwood, William B., 9 Balvie Avenue, Giffnock
1938 Lowe, David N., 8 Melville Street, Pollokshields, Glasgow
1938 M'Leod, George, Suinary, Busby Road, Clarkston
1938 Rennie, Miss Jen, Glenview, Paisley

2.—PERTH DIVISION

ANGUS

(Western District)

1938 Boyd, James B., Gourdie Farm, Liff, near Dundee
1937 Dundas, George, Solicitor, Kirriemuir
1937 Fearn, James, 40 Roods, Kirriemuir
1938 Lamb, Miss Jeanette Gellatly, Solicitor, Kirriemuir
1937 Leese, John, General Manager, Dundee Eastern Co-operative Society, Ltd., 14 Peter Street, Dundee
1938 Lyell, Lord, of Kinnordy, Kirriemuir
1937 Muir, William C., Nevay Park, Newtyle
1937 Murdoch, Alexander, Kinpurnie Farm, Newtyle
1938 Nisbet, James, V.S., Easterbank House, Forfar
1937 Spence, Albert W. D. (Messrs A. Spence & Co., Ltd.), 19 and 20 West Dock Street, Dundee

FIFE

1937 Baillie, David A., East Grange, Blairhall
1937 Bell, John, East Bowhouse, Leslie
1938 Brown, James, Dhuloch Home Farm, Dunfermline
1938 Brown, Robert, Dhuloch Home Farm, Dunfermline
1937 Brunton, George, c/o Messrs Speedie Brothers, Ltd., Auctioneers, Cupar
1937 Cousland, Christopher C, Bankhead, Markinch
1937 Elder, Hugh, Pitbauchlie, Dunfermline
1938 Erskine, Donald Ross, Myrend Farm, Cairneyhill, Dunfermline
1937 Ferguson, Robert, East Camps, Carnock, Dunfermline
1937 Fleming, John, Rennyhill, Anstruther
1937 Forrester, Robert, Gowrie Cottage, Lochgelly
1937 Garrett, A. R. T., Moray Estates Development Company, Moray Estates Office, St Colme House, Aberdour
1937 Gray, James, jun., West Newhall, Kingsbarns
1937 Harley, James Thomson, Wester Pitcorthie, Dunfermline
1937 Henderson, John M'Farlane, Lumquhat Farm, Auchtermuchty
1937 Hutchison, Miss Joan, Largo House, Fife
1937 Lang, James G., Starr, Cupar
1937 M'Crone, R. W., Pitliver House, Dunfermline
1937 M'Crone, Mrs R. W., Pitliver House, Dunfermline
1937 Mitchell, Angus, Manager, Pathhead & Sinclairtown Reform Co-operative Society, 102 Commercial Street, Kirkcaldy
1938 Paton, William, Carberry, Kirkcaldy
1938 Rae-Arnot, G., Lochieheads, Auchtermuchty
1937 Ross, William, Baldownie Mains, Newmills
1937 Shanks, Harry T., Falkland Wood Farm, Falkland
1937 Short, A. Gordon, British Sugar Corporation, Ltd., Cupar
1937 Short, Mrs Dorothy, Royal Hotel, St Andrews
1937 Simpson, Frank, 79 Halbeath Road, Dunfermline
1937 Spence, James, Farm Manager, Strathenry Home Farm, Leslie
1937 Torrance, James, 74 Halbeath Road, Dunfermline
1937 Wilson, John, Mains of Beath, Crossgates
1937 Young, William, Annfield, Montrave, Leven

KINROSS

1937 Baxter, George, Lochburn Terrace, Kinross
1937 Stewart, W. J., Hartfell, Kinross
1937 Suttie, John, Classlochie, Kinross
1937 Thompson Arthur R., Royal Hotel, Milnathort
1937 Watt, William, Arlary, Milnathort

PERTH

(Perth Show District)

1937 Adam, George, Tibbermallo, Methven
1937 Anderson, J. A., Auctioneer, 8 Gray Street, Perth
1938 Bell, Miss C. C., Chapelbank, Auchterarder
1938 Bell, Miss Lilian Mary, Chapelbank, Auchterarder
1937 Cox, Mrs J. E., Methven Castle, Methven
1937 Darling, Major James Adam, Milton, Ardtalnaig, Aberfeldy
1938 Duncan, Major Alan, of Dunbarney, Bridge of Earn
1938 Fothringham, Donald Steuart, of Murthly, Murthly Castle, Murthly
1937 Honeyman, Miss Elizabeth M., Derculich, Strathtay
1937 Lindsay, David, Nine Oaks, Oakbank Road, Perth
1938 MacDiarmid, Donald Bruce, Milton of Collace, Kinrossie
1937 Simpson, Mrs, Glencarse House, Glencarse
1937 Weir, George T., M.R.C.V.S., 32 York Place, Perth

3.—STIRLING DIVISION

CLACKMANNAN

1937 Baxter, R. P., Midtown, Cambus
1937 Black, Alexander, 6 Church Street, Alloa
1937 Black, Mrs Alexander, 6 Church Street, Alloa
1937 Black, Hamish, 6 Church Street, Alloa
1937 Brodie, William, Devonknowes, Tillicoultry
1937 Cullens, John, Dollarbank, Dollar
1937 Grindlay, William, jun., Grassmainston, Clackmannan

1937 Haig, A. W., Dollarfield, Dollar
1937 Hall, A., 40 Tullibody Road, Alloa
1937 Hendry, Andrew B., Northfield, Cambus
1937 Keddie, John M., Loanhead, Dollar
1937 Kinross, Donald A., jun., Hillend Farm, Clackmannan
1937 Kirk, Miss E., Kainknowe, Glendevon, Dollar
1937 Lennox, John, 17 Mar Street, Alloa
1937 M‘Gregor, Charles, Island Farm, South Alloa
1937 M‘Laren, Duncan R., Inch, Kincardine-on-Forth
1937 M‘Laren, John, Inch, Kincardine-on-Forth
1937 M‘Nee, Daniel Olive Wilson, Glendevon House, Dollar
1937 Mitchell, James Archibald, The Arns, Clackmannan
1937 Norval, James Allan, Tullygarth, Clackmannan
1937 Prentice, Miss Jeanie, Craigrie, Clackmannan
1937 Rennie, William, Burgh Buildings, Alloa
1937 Sinclair, George, Glendevon, Dollar
1937 Sinclair, William, Rosslyn House, Glendevon, Dollar
1937 Snadden, David, jun., Gartenkeir, Tillicoultry
1937 Thomson, John, Garvell, Cambus
1937 Wardrop, David, The Firs, Tullibody
1937 Wilson, Robert Meikle, Muircot Farm, Tillicoultry
1938 Whitson, Ronald S., Middleton Kerse, Menstrie

DUMBARTON

1937 Aitken, William, Garscube Estates Office, Bearsden
1937 Bennie, William, Merkins, Alexandria
1937 Black, James, Tullichewan, Alexandria
1938 Burns, C. P., "Allandale," Stirling Drive, Bearsden
1937 Cairns, John, 97 Westerton Avenue, Bearsden
1937 Duncan, Mrs A., Auchinbee Farm, Croy
1937 Duncan, John, Auchinbee Farm, Croy
1937 Findlay, T. D., of Boturich Castle, Balloch
1937 M‘Arthur, James, Old Kirk Farm, Balloch
1937 Mackenzie, Rear-Admiral W. B., R.N., of Caldarvan, Alexandria
1937 Orr, James, Blairnile, Alexandria
1938 Paterson, Mrs Margaret H., "Morar," Milngavie
1937 Russell, T. R., Luss Estate Office, Helensburgh
1937 Whiteford, James, Bardowie, Milngavie
1937 Whiteford, John, Bardowie, Milngavie

PERTH

(Stirling Show District)

1937 Aikman, James Cowan, Dykedale, Dunblane
1937 Allison, William, East Brae, Doune
1937 Bain, Jack, Croftvale, Doune
1937 Bain, James, Glenisla, Doune
1937 Barr, Mrs Margaret, Drumloist, Callander
1937 Bayne, John, Montrose Road, Auchterarder
1937 Beaton, Hugh, Butcher, Methven Street, Auchterarder
1937 Buchan, George A., Argaty, Doune
1937 Buchan, R., Greenhall, Crieff
1938 Buchanan, John Stewart, Auchreoch, Crianlarich
1937 Cairns, John M. M., Dalchruin, Comrie
1937 Cairns, William Robert, Concraig, Crieff
1937 Calder, Alistair G., Ardoch, Dunblane
1937 Callum, John, Kirktonlees, Auchterarder
1937 Chalmers, John, Braco Castle Home Farm, Braco
1938 Christie, Duncan Henderson, East Torrie Farm, Callander
1937 Comrie, Andrew C., Drummie Farm, Crieff
1937 Dawson, Colonel Rupert George, Orchil, Braco
1937 Dickson, David Rutherford, Glassingall, Dunblane
1937 Ewing, W. A. E., Crieffvechter, Crieff
1937 Fotheringham, William, Woodlane, Blair Drummond, by Stirling
1937 Fulton, John, Anchorscross, Dunblane
1937 Fulton, Thomas M., Anchorscross, Dunblane
1937 Garvie, D., Inchbrakie, Crieff
1937 Gudmundsson, Benedikt, Shearerston, Crieff
1937 Harris, Hugh J., The Kinnaker, Gleneagles, Auchterarder
1937 Holmes, Thomas B., Deanston Farm, Doune
1937 Kerr, David, Peterhead Farm, Gleneagles, Auchterarder
1937 M‘Gugan, Edward Stuart, Shrubhill, Dunblane
1937 Millar, John, Hillside, Dunblane
1937 Miller, Andrew G., Templemill, Crieff
1937 Rennie, James A., Kirkton, Doune
1937 Rentoul, John, 70 Maine Street, Doune
1938 Paulet, Richard C., Bennie, Braco
1937 Ritchie, Alexander, Cardross Home Farm, Port of Menteith
1937 Robertson, William, Nether Fordun, Auchterarder
1937 Shaw, James, Pett Farm, Muthill
1938 Skelton, J. G., Dall Lodge, Killin
1937 Stalker, Anthony, jun., Broomhill, Braco
1938 Stewart, John, Ardvorlich, Lochearnhead
1938 Stewart, John, Solicitor, Dunblane
1937 Watson, James, Ochiltrees, Muthill
1937 Young, James, Daldorn, Doune

STIRLING

1937 Adam, William G. M., Craigannet, Denny
1937 Alexander, George M., c/o Messrs Speedie Brothers, Ltd., Auctioneers, Stirling
1937 Alston, John, Ballikinrain, Balfron
1937 Anstruther, Daniel, 30 Cecil Street, Stirling
1938 Armstrong, John, Buchanan Home Farm, Drymen
1937 Bain, John M‘Ewen, jun., Crawtree, Kippen
1937 Baird, Thomas, Wester Newlands, Falkirk
1937 Banks, William C., Brentham Avenue, Stirling
1937 Bell, William, North Bellsdyke Farm, Bothkennar, Falkirk
1937 Black, Alexander, Blackdub Farm, Bridge of Allan

1937 Bryce, R., Westwood, by Stirling
1937 Bryce, William B., Cambusdrennie, by Stirling
1938 Buchanan, David, Farm Manager, Craighat, Dumgoyne Station
1937 Bullions, A., Drum Farm, Kippen
1938 Burnet, David, Main Street, Drymen
1937 Cairns, J. Harvey, Sauchie Home Farm, Stirling
1937 Cameron, Allan, Messrs Speedie Brothers Ltd., Auctioneers, Stirling
1937 Christie, Forrest Jenkins, Coxithill, Stirling
1937 Christie, James, Dalfoil Farm, Balfron
1937 Clark, Captain John, Glenboig Farm, Fintry
1938 Clark, William J. B., Halls of Airth, Falkirk
1937 Cowan, Robert, Broomridge Farm, St Ninians, Stirling
1937 Cunningham, R. D., c/o Messrs Speedie Brothers, Ltd., Auctioneers, Stirling
1937 Davidson, James, jun., Gartocharn, Balfron Station
1937 Dobie, John, Barcloich, Lennoxtown
1937 Duncan, George H., Westerton Farm, Bothkennar, by Falkirk
1937 Duncan, John, Westerton Farm, Bothkennar, by Falkirk
1937 Featherston, Hugh, Dalmorglen Park, Stirling
1937 Findlay, Robert, Snabhead, Bannockburn
1937 Fyfe, W. S., 10 Queenshaugh Drive, Stirling
1937 Girvan, Martin, Barnsdale, Whins of Milton, Stirling
1937 Gray, Miss Agnes Margaret, 4 Gladstone Place, Stirling
1937 Gray, Alexander, Main Street, Thornhill
1937 Gray, David, 8 Union Street, Stirling
1937 Gray, David G., 8 Union Street, Stirling
1937 Haddow, George, Carlston, Torrance of Campsie
1937 Hay, John, Main Street, Thornhill
1937 Hay, Mrs John, Main Street, Thornhill
1937 Henderson, William, Burnbank Farm, Throsk
1937 Hendry, William, Birkenwood, Kippen Station
1937 Hope, John, Easter Greenyards Farm, Bannockburn
1937 Jamieson, George M., Little Kerse, Polmont
1937 Jenkins, Mrs Thomas, Cornton, Bridge of Allan
1937 Johnston, Alexander, 11A Weir Street, Falkirk
1938 Kirkland, William, Hoich Farm, Balfron Station
1937 M'Allister, John, Cowdenbank, Stirling
1937 M'Farlane, Alexander, Bridge Haugh House, Stirling
1937 M'Farlane, Andrew, Westwood Farm, by Stirling
1937 M'Gregor, Hugh, jun., West Carse, Stirling
1937 M'Laren, Mrs James, jun., Alton Stirling
1937 M'Lay, William, Dunvegan, Causewayhead, Stirling
1937 M'Naughton, William, Butcher, Bannockburn
1937 MacNeill, Duncan, Dunmar, Bridge of Allan
1937 Miller, M., Manager, Stirling Co-operative Society, Ltd., Barnton Street, Stirling
1937 Mitchell, Robert, Dasherhead, Gargunnock
1937 Moir, D., Nethercarse, Kippen Station
1937 Muirhead, John, 15 Victoria Square, Stirling
1937 Muirhead, Robert S., Pirnhall Farm, Bannockburn
1937 MURDOCH, Lady Burn, The Blair, Blairlogie
1937 Oswald, David M., Northfield, Denny
1938 Pitcairn, James, Birdston Bank, by Kirkintilloch (Stirlingshire)
1937 Rennie, Miss Hilary Margaret Macfarlane, "Craighat," Dumgoyne Station
1937 Renton, John P., Coachbuilder, Dunipace, Denny
1937 Renton, Johnston, Coachbuilder, Dunipace, Denny
1937 Robertson, George Donald, 12 Manse Crescent, Stirling
1937 Scott, Mrs Wm. R., Balfunning, Balfron Station
1937 Stewart, David, Boquhapple Farm, Thornhill
1937 Stewart, William, Moana Maia, Kippen
1937 Stirling, John, Joiner, Causewayhead, Stirling
1937 Templeton, W. M., Headswood Farm, Denny
1937 Thomson, A., Haugh of Blackgrange, by Stirling
1938 Thomson, Samuel, Dunipace Mill, Larbert
1937 Thomson, William, Secretary, Stirling Agricultural Society, 27 Barnton Street, Stirling
1938 Thornley, Gilbert Macintosh, Garthill, Falkirk
1937 Troup, William P., jun., 52 Wallace Crescent, Polmont
1937 Urquhart, James D., 24 Princes Street, Stirling
1937 Waddell, James, Buchanan Street, Balfron
1937 Watt, Mrs I., Boquhapple House, Thornhill
1937 Watt, Robert, Tods Buchts, Slamannan
1937 Young, John, Cobblebrae Farm, Falkirk

4.—EDINBURGH DIVISION

EAST LOTHIAN

1938 Butter, Mrs A. E., of Newton Hall, Gifford
1938 Clapperton, Mrs E. M., Garvald Mains, Haddington
1937 Gibson, Frank P., Seton, Longniddry
1937 Nairn, William, Upper Keith, Humbie
1938 WEMYSS AND MARCH, The Earl of, Gosford House, Longniddry

MID-LOTHIAN

1938 Beaton, Allan, Wardie House, Boswall Road, Edinburgh
1937 Chapman, Mrs, Torsonce, Stow
1938 Crawford, J. A. L., 10 Corrennie Drive, Edinburgh
1937 Dunlop, Mrs Marion S., Buteland House, Balerno

1937 Fleming, G. J. (Manager, Kassala Cotton Company, Ltd. (Sudan)), 30 Royal Circus, Edinburgh
1937 Foister, Dr C. E., Seed Testing Station, East Craigs, Corstorphine, Edinburgh
1937 Forsyth, Joseph Dickson, Torcraik, Gorebridge
1937 Foster, J. E., 2 Marchmont Crescent, Edinburgh
1937 Frankland, Ronald W., 109 Princes Street, Edinburgh
1937 Macdonald, Alastair, N.D.A., 8 Dundas Street, Edinburgh
1938 Maxwell, Samuel B., B.Sc., N.D.A., Edinburgh and East of Scotland College of Agriculture, 13 George Square, Edinburgh 8
1937 Miller, F. C. A., 46 Brunstane Road, Joppa
1937 Miller, G. Drummond, 4 East Restalrig Terrace, Leith
1938 Milne, William, 10A Great King Street, Edinburgh
1937 Moss, E. C., Toxside, Gorebridge
1937 Roy, James, Ransfield, Ratho
1937 Scarlett, John Henry, Goshen, Musselburgh
1937 Smith, Professor Sir William Wright, M.A., F.R.S.E., Inverleith House, Edinburgh
1938 Spence, John, Clermiston Mains, Corstorphine, Edinburgh 12
1937 Stewart, Dr James, M.A., D.Sc., Ph.D., Animal Diseases Research Association, Moredun Institute, Gilmerton
1937 Stewart, Robert B., Rowanbank Nursery, Corstorphine
1937 Tainsh, Robert, 2 Castle Street, Edinburgh
1937 Wight, George Russell, Heriot Town, Heriot
1938 Whyte, William, General Manager, Royal Bank of Scotland, St Andrew Square, Edinburgh

WEST LOTHIAN

1937 Brown, Craig, Bonnytoun, Linlithgow
1937 Cadzow, James Brian, Glendevon, Winchburgh
1937 Cullen, Jack, Craigiehall, South Queensferry
1938 Johnston, James, East Mains of Ballencrieff, Bathgate
1937 Kerr, Andrew, Westfield, Winchburgh
1937 Kirkwood, William, East Kerse Mains, Bo'ness
1937 M'Donald, John, Crawhill, Bathgate
1937 M'Donald, Robert, Crawhill, Bathgate
1937 Meikle, James, East Bangour, Uphall
1937 Waddell, Peter J., Park Farm, Linlithgow
1937 Wilson, William, Parklay Craigs, Linlithgow

5.—ABERDEEN DIVISION

ABERDEEN

1938 Dean, James, c/o Mrs Willis, 245 Union Street, Aberdeen
1937 Duff, Mrs G. B., Hatton Castle, Turriff
1937 Duncan, Robert A. L., Agricultural Department, Marischal College, Aberdeen
1938 MacKay, William, M.R.C.V.S., Drumblair House, Forgue, Huntly
1938 Mackintosh, R. D., M.R.C.V.S., Denver, Insch
1938 Mair, Harry, 10 Saphock Place, Inverurie
1938 Milne, Edward Hall, c/o Scottish Agricultural Industries, Ltd., Blaikie's Quay, Aberdeen
1938 Reith, Ronald J., North of Scotland College of Agriculture, 41½ Union Street, Aberdeen
1937 Turner, Norman, B.Sc., N.D.A., 41½ Union Street, Aberdeen
1938 Walker, Arthur, Tullygreig, Udny
1938 Watson, William, 20 The Square, Ellon

ANGUS

(Eastern District)

1938 Alexander, Alfred, Smallbank, Marykirk, Montrose
1938 Craig, George, Dalhestnie, Brechin
1937 Irving, Miss Margaret, Blackhall, Brechin
1938 Laing, William M., 3 Hayswell Road, Arbroath
1938 Lindsay, Alexander, "Nechtan," Keptie Road, Arbroath

BANFF

1938 Dickson, William, Sandyhills, Banff
1937 Forbes, William James, Rettie, Banff
1938 Gray, William, Mill of Park, Cornhill
1937 Kerr, John N., 81 High Street, Banff

KINCARDINE

1937 Anderson, George J. C., Kair, Fordoun

6.—DUMFRIES DIVISION

DUMFRIES

1938 Beattie, William, Dornock Mills, Eastriggs
1937 Boswell, John Patrick Douglas, Bennan, Tynron
1937 Campbell, Dr, Lochmaben, Dumfries
1938 Crawley, J. K., Denbie, Lockerbie
1938 Crawley, Mrs, Denbie, Lockerbie
1937 Critchley, Captain Ronald Asheton, of Stapleton Tower, Annan
1938 Fox, Captain John, M.C., Woodlea, Moniaive
1938 Gibson, Hugh, Wood Farm, Parkgate
1938 Gibson, William, Farm Manager, Hartwood, Lockerbie
1937 Hyslop, Arthur, 22 Buccleuch Street, Dumfries

1937 Johnstone, Miss Marjorie, Dixons, Lockerbie
1938 King, John, jun., of Tanlawhill, Lockerbie
1937 Laurie, Miss Christina Eve, Jarbruck, Moniaive
1938 M'Bride, Archibald J., Millbank, Lockerbie
1937 Macmillan, Miss Mary G., Glencrosh, Moniaive
1938 Macmillan, Mrs Rachael Vere, Millburn, Moniaive
1937 Moffat, J. R. Kennedy, Milliganton, Auldgirth
1937 Nicol, Mrs J. L., Newfield, Ecclefechan
1937 Stoddart, James F., Linbridgeford, Waterbeck, Lockerbie
1938 Ward, John, Woodhead, Moffat

KIRKCUDBRIGHT

1938 Cameron, James, Stonehouse, Crocketford, Dumfries (Kirkcudbright)
1938 Carswell, John Whitfield Jackson, Barcairn, Dalbeattie
1937 Corrie, Mrs Amy M., N.D.A., N.D.D., Auchengool, Dundrennan, Castle-Douglas
1938 Craig, William A., Compstonend, Twynholm
1938 Douglas, Alexander, Torkatrine, Dalbeattie
1937 Gibson, Alexander, M.R.C.V.S., 27 St Mary's Drive, Kirkcudbright
1938 Gordon, Mrs W. E., Dunjop, Castle Douglas
1938 Grierson, Walter, Farm Manager, Butterhole, Troqueer, Kirkcudbright
1938 M'Sherry, William, Shawfoot, Southwick, Dumfries (Kirkcudbright)
1938 Parker, William Thomas, Auchengool House, Kirkcudbright
1938 Rogerson, Douglas, Gibbonhill Farm, Troqueer, Kirkcudbright
1938 Wallet, J. A. D., Dunjarg, Castle Douglas

WIGTOWN

1938 Bell, James, Mosscroft, Stoneykirk
1937 Christison, William, Barglass, Kirkinner
1938 Clanachan, Alexander, Endfield, Stranraer
1937 Dunlop, George, Knocktimn, Ervie, Kirkcolm
1938 Dunn, George Eric, Barsolus, Stranraer
1938 Ewing, Bailie Andrew, Glenotter, Stranraer
1938 Ferguson, James J. A., Cults, Stranraer
1937 Fletcher, Peter H., Galloway House Estate Office, Garlieston
1938 Galloway, James, Challochmun, Glenluce
1938 Gibson, William K., Endcliffe, Stranraer
1937 Grierson, Thomas, 6 South Main Street, Wigtown
1938 Hunter, Stephen, Whiteleys, Stranraer
1938 Kerr, Robert, Ochtrelure, Stranraer
1937 Littlejohn, Percy Walter, Skaith, Newton-Stewart
1937 Littlejohn, Quintin, jun., Skaith, Newton-Stewart
1938 M'Caig, John, Kilhilt, Stranraer
1938 M'Culloch, Hugh, Port O'Spittal, Stranraer
1937 M'Dowall, Norman, Moorpark, Kirkinner
1938 M'Harg, David, Drochduil, Glenluce
1938 M'Master, William, Culhorn Mains, Stranraer
1937 M'Nally, George C., jun., Park View, Stoneykirk
1937 Matthews, Alexander, British Linen Bank Buildings, Newton-Stewart
1938 Murray, John Hyslop, Beech, Stranraer
1938 Neil, David, Kilbreen, Stranraer
1938 Parker, William W., Inchparks Farm, Stranraer
1938 Rodan, A. M., "Newlands," Seabank Road, Stranraer
1938 Vallance, John, Auchness, Stranraer
1938 White, Andrew, Planting End, Stranraer
1937 Wither, Mrs James, Awhirk, Stranraer
1938 Young, William, Gillespie, Glenluce

7.—INVERNESS DIVISION

CAITHNESS

1938 Bruce, James Brims, Tarroul, Watten
1938 Stewart, Ian, Reisgill, Lybster
1938 Sutherland, Andrew, Latheronwheel Mains, Latheron

INVERNESS

1938 Cameron, Donald, Achintee, Fort William
1937 MacGillivray, Mrs Janet Ogilvie, Kirkton, Bunchrew
1938 Ross, Thomas, 9 Beaufort Gardens, Beauly
1937 Stewart, George, Dalbuiack, Carr Bridge

MORAY

1937 Morrison, Robert J., Darnley House, Fochabers

ORKNEY

1937 Ritch, James, Hatston, St Ola
1937 Taylor, David, 26 Slater Street, Kirkwall

ROSS AND CROMARTY

1937 Anderson, R. T. W. Wilson, Solicitor, Dingwall
1937 Frater, W. D., c/o The Highland Agricultural Co., Ltd., Invergordon
1937 MacKenzie, Alexander, Grantfield Farm, Tain
1938 M'Lennan, Donald J., Rootfield, Conon Bridge

SHETLAND

1938 Sanderson, Miss Isabella, N.D.D., 67 Commercial Street, Lerwick

SUTHERLAND

1937 Mackenzie, James, Kirkton Farm, Golspie

8.—BORDER DIVISION

BERWICK

1937 Aiton, Mrs Marion Scott, Legerwood, Earlston
1937 Sharpe, Miss Ruby, The Park, Earlston
1937 Smith, Dr William A. Wilson, Cumledge, Duns

PEEBLES

1938 Smellie, John, Hatton Knowe, Eddleston

ROXBURGH

1938 Allan, David Harper, Smailholm Mains, Kelso
1938 Bell, Herbert D., Eildon Village, Melrose
1938 M'Leod, Donald Matheson, M.A., Schoolhouse, Denholm, Hawick
1938 Moffat, Francis, Hartsgarth, Newcastleton
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